

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2379.—Vol. LI.

LONDON, SATURDAY, MARCH 26, 1881.

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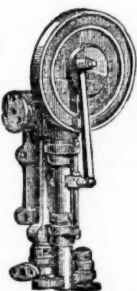
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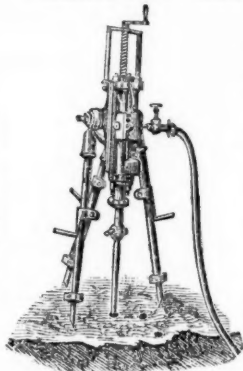
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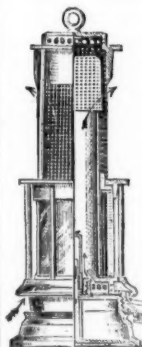


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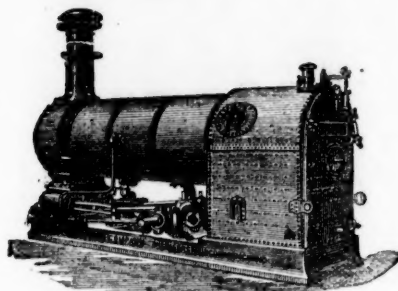
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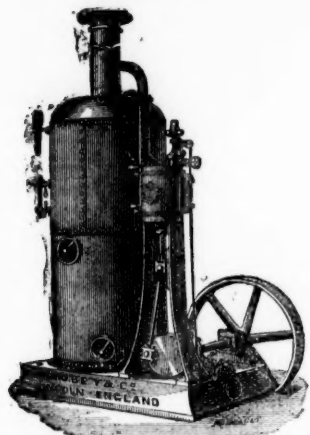
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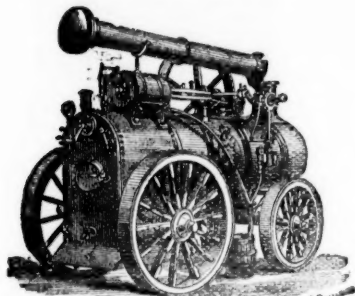
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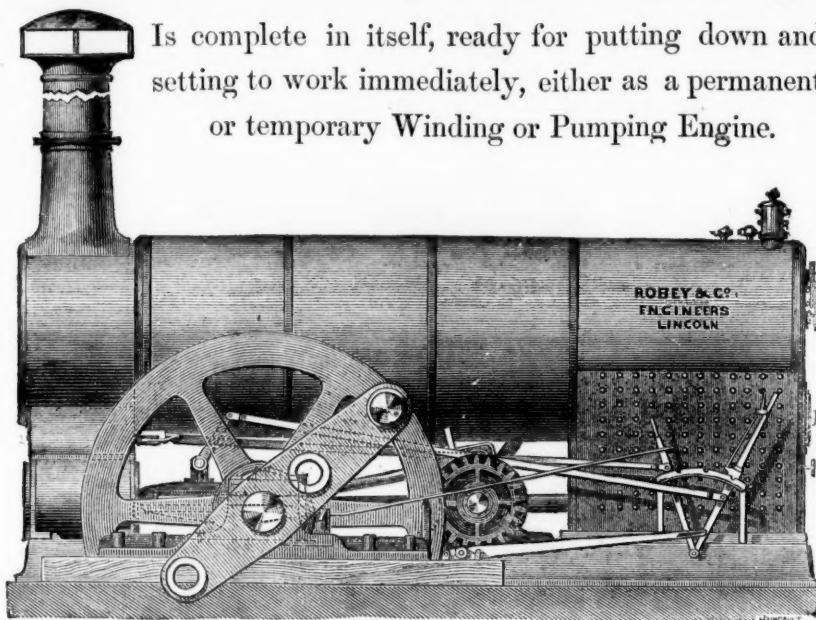
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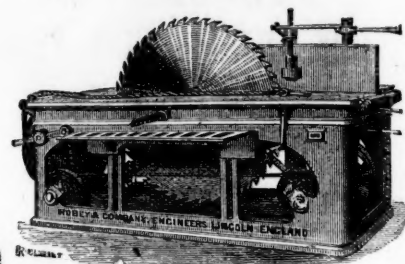
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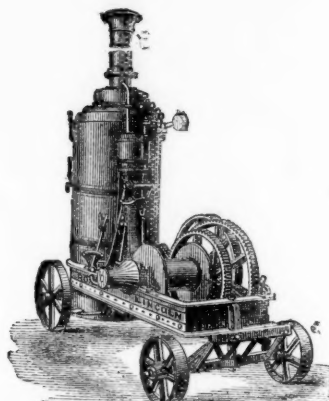
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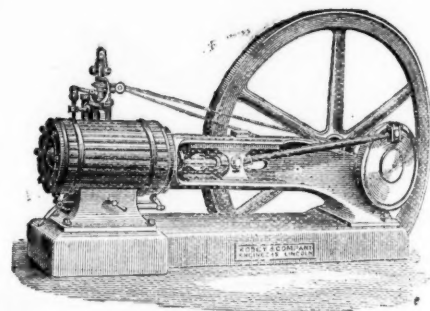
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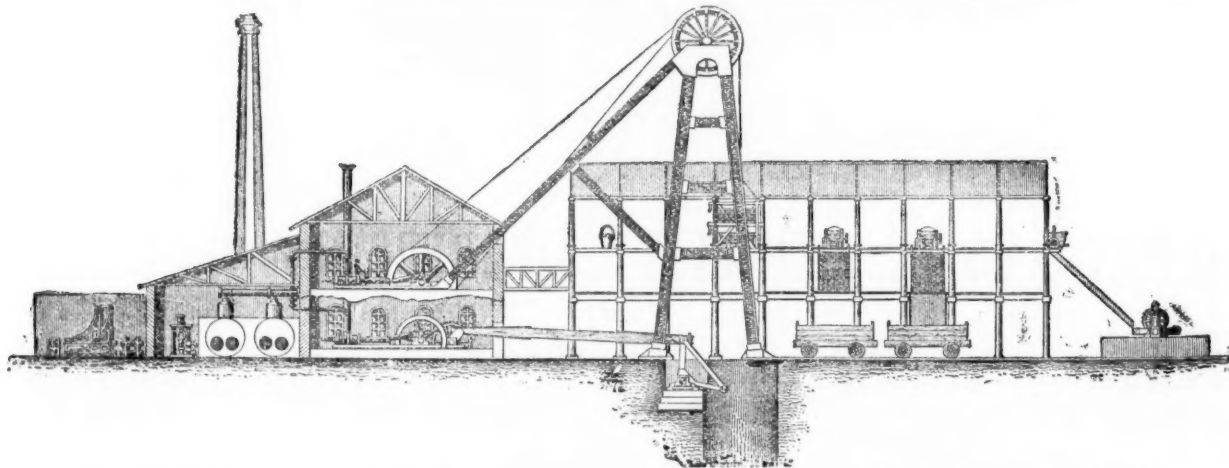
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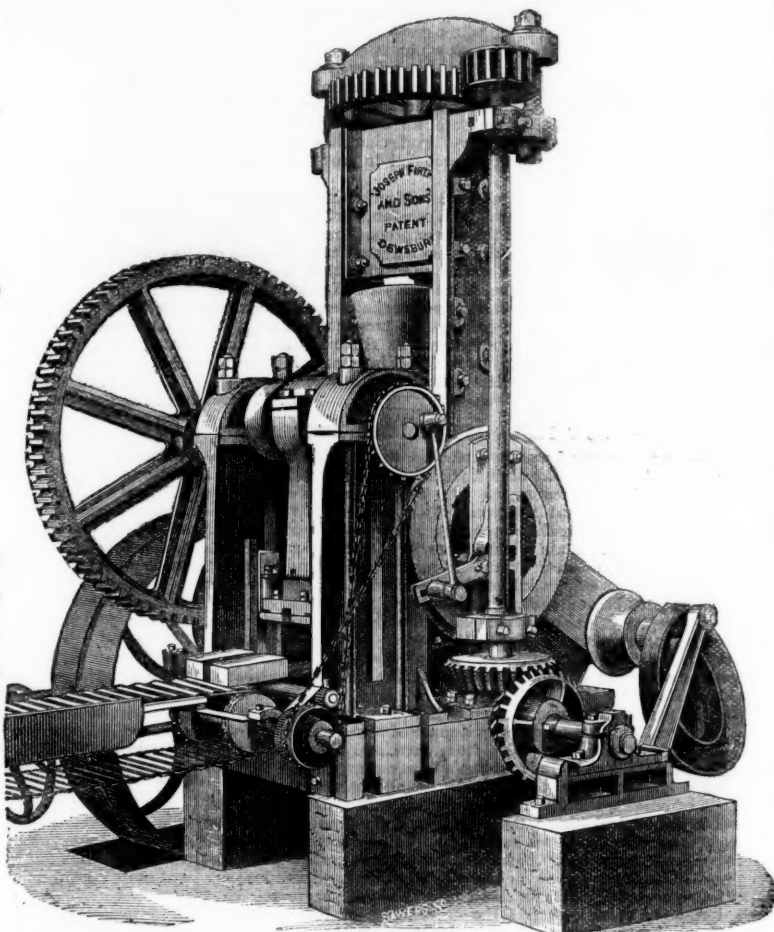
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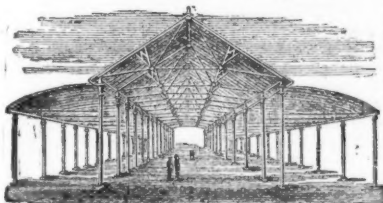
It makes two bricks at once and will make 12,000 to 14,000 Plastic Pressed Bricks per day, hard enough to go direct to the Kiln without drying; or it will make the bricks thoroughly plastic if required. For Works requiring a Machine at less cost the Machine is made to turn out one brick at once, and is capable of producing 8000 bricks per day

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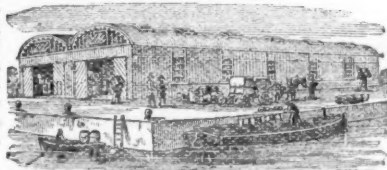
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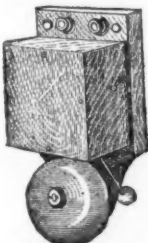
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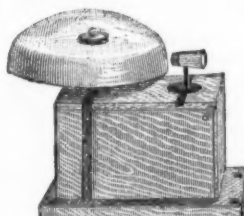
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PARIS, 1867.
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH, 1867.
SILVER MEDAL, 1867.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10, 28'30, 27'10, 28'40, 28'70 metres. Total advance of south heading during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere (7½ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL; and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

These Machines possess many advantages, which give them value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL USE THROUGHOUT THE WORLD FOR MINING, TUNNELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the most portable—the most durable—the most compact—of the best mechanical device. They contain the fewest parts—have no weak parts—act without SHOCK upon any of the operating parts—work with a lower pressure than any other Rock Drill—may be worked at a higher pressure than any other—may be run with safety to FIFTEEN HUNDRED STROKES PER MINUTE—do not require a mechanic to work them—are the smallest, shortest, and lightest of all machines—will give the longest feed without change of tool—work with long or short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or open work. Their working parts are best protected against and accidents. The various methods of mounting them are the most efficient.

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LEATHER MILL BAND AND HOSE PIPE MANUFACTURERS

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11, Parade, Truro, 3rd February, 1881. R. SYMONS

MAP OF CALLINGTON, CALSTOCK, AND TAVISTOCK MINING DISTRICTS.

Proposed to be published by subscription, a MAP of the ABOVE DISTRICTS, showing the names and boundaries of all existing settlements, roads, cross-roads, and every other matter which such a map should contain. Persons disposed to patronise the publication—at One Guinea per copy—will please send their names as early as possible to me.
February 3rd 1881. R. SYMONS, Mineral Surveyor, Truro.

TO PARENTS AND GUARDIANS.

AN ELIGIBLE OPPORTUNITY is now offered for the SETTLEMENT of an ACTIVE YOUNG GENTLEMAN IN CANADA. He will be enabled to obtain his profession as a Solicitor in five, or if he be a Graduate in three years. Cost of living about £150. In the meantime he will have active work, and obtain a knowledge of the Dominion, which is destined to be one of the most prosperous of the Colonies. Premium, £100 sterling.
HERBERT C. JONES, Canada Land and Loan Agency.

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Original Correspondence.

MINING LEVELS, LEVELLING, &c.

SIR,—In the setting out of mines underground it appears that many of our best engineers are of opinion that not sufficient attention has been paid to the economy of the conveyance of minerals from the point where they are worked to the bottom of the shaft from which they were sent to the surface. This involves the question as to the construction of the carriages, but the roads as well whereon they have to travel, and by a judicious arrangement both time and expense may be much economised. At the present time minerals have to be conveyed from a lower level to a higher one, and up gradients to a considerable length, requiring a good deal of animal or other power; but a great saving would be effected were the roads more level. Steam and compressed air power are now fast superseding horses and ponies in our mines, and with these allies it is essential to the proper working of underground hauling that the roads to be traversed by the trains should, where such could be done without any serious difficulty, be perfectly straight, and of one uniform gradient. This is all the more important just now, seeing that the cost of production is being materially augmented by the increased distance at which our minerals are being worked from the point of egress of the mine, so that the question of roads and haulage calls for the energetic and ingenious resources of our mechanical as well as mining engineers. In opening out a mine the greatest attention should be paid to the laying out of the main levels, so as to keep them at the smallest inclination that will allow of the water running off. A rise of 1 ft. in 200 horizontal feet has generally been found sufficient for the purpose, giving a horse an equal load in drawing an empty tram up or a full tram down. At an inclination of 1 in 70 to 1 in 100 wagons will descend of themselves, and consequently require to be spragged or checked by a brake. In coal mines it has been usually considered desirable to drive the main levels threefold, the lowest being for a water level, and being kept rather in advance of the others it acts rather as a feeler to ascertain rolls or faults in the ground, and to preserve the proper direction and inclination through which the top or bottom of the other levels have to be cut. The levels and headings should be driven quite straight, and pegs or nails should be placed in the roof, and the workmen should not have less than three of these points at one time to refer to. If the main roads are not driven nearly level a good deal of the mineral is left to the deeper side of them, which has to be brought up hill at much cost and inconvenience from haulage and water.

Where minerals have to be conveyed in large quantities from a lower level to a higher one steam or compressed air are found to be the most economical power that can be used, for from experiments made with horse-power it has been proved that the useful performance of a horse underground is not more than one-third or one-fourth of a horse working at the surface. It has, however, been found that the maximum effect of horse labour is obtained on roads in a mine with the ordinary carriages to be found at most coal mines, in particular when the gradients for the empty carriages rise 1 in about 130. When the roads are kept in bad condition the rubbing of the flanges of the wheels against the rails is very great, and this, of course, must lead to considerable loss in the long run. As regards self-acting planes, experience has shown that they can be adopted with advantage where the mineral being worked comes for a considerable distance down gradients not having a fall more than 1 in 30. This, of course, is a much heavier gradient than may be used at the surface, owing to the smallness of the friction of the carriages and the rope sheaves attained at the surface compared to what is ordinarily attained underground. It may also be said that the wheels used at the top of self-acting inclines, around which the chain or rope passes, in many cases have to be frequently moved as the working face advances; and where this is found necessary the mode of placing the wheels should be such as to render their removal easy and inexpensive; but where the inclination is considerable the gravitating power, of course, exceeds the sum of resistance arising out of the moving parts of the machinery, and what is due to gravity in drawing up the empty carriages. Where this is the case the surplus power can be easily destroyed by means of a brake made to act upon the wheel at the top of the incline. In our coal mines the plan adopted at many of them is by driving the main or horse levels north and south from the bottom of the shafts, being followed on the dip side by the water level; on the rise side the middle and bank levels are driven simultaneously with the main level, and about 20 yards from each other, openings being driven at some distance apart from the main to the bank level, and at from 40 to 50 yards asunder from the main to the water level.

In one mode of working, where this has been done, bord-gates are driven towards the rise of the steam, and where the sett of levels have advanced some distance similar bord-gates are driven, and then the leading bank is started from the bank level and worked towards the rise. Slits are driven from the bank level, and when they are holed into the bank they are converted into roads for the conveyance of coal from the face. There are, however, other systems adopted in the working of minerals and the driving of levels; some, undoubtedly, more advantageous and economical than others, but after all, the best system, and that involving the least expense, is the one that should be generally adopted, and for that purpose individual opinions should be altogether set aside. In all cases, therefore, in the laying out of new underground work the greatest consideration, should be given by those who have the control of the operations to the level, carriages, and the mode of haulage; for, with our known knowledge, there is plenty of room for improvement in those directions, and which if carried out could not fail to lessen the cost of working our mines, give increased safety to those working in them, so benefiting both owners and workmen. For underground levelling various instruments are used, the great object, of course, being accuracy, and with respect to this there is no difficulty under ordinary circumstances. But improvements have taken place from time to time. A few years since Dr. Aita, of Padua, had to take the level of that town for the purpose of carrying out some important sanitary works, and he introduced an instrument that did the work well and in every way satisfactorily. The instrument found its way to England, and one or two of our engineers, struck with its adaptability for levelling in coal and other mines, made several improvements in its construction as well as in the mode of applying it. It has been adopted at some places, and we believe only requires to be known to come into more general use, for an effective and practically valuable novelty is always welcome.

The instrument or apparatus consists of two glass tubes connected together by an india-rubber pipe of a convenient length—say, 10 or 12 yards. Each of the glass tubes has attached to it a scale, on which are marked sub-divisions in the same manner as upon the ordinary levelling staff. About the centre of each scale the tubes are filled with a coloured mixture, so as to render the former more distinctly visible. When the scales were held vertically upon any sloping or uneven surface, and at any distance apart that the length of the india-rubber pipe would admit of, the difference of the readings denoting the position of the coloured liquid in each tube would represent the difference of height between the stations at which the scales were held. In one instrument made the length of the glass tubes was 3 ft., and of the india-rubber connection 12 yards. That instrument, it may be said, was specially constructed to meet the requirements of low workings in ordinary mines, but longer scales and tubes could be advantageously adopted either in surface levelling or in mines where the workings were high. In having long tubes and attaching them permanently to the scales was a departure from the instrument used by Dr. Aita, for the glass tubes in the Aita level were only a few inches in length, and were moveable upon the scales, being attached by means of a sliding frame, which could be raised or lowered at pleasure. But instead of the liquid in the English instrument simply finding its own level in the tubes, the tubes themselves were lifted in the Aita instrument so as to suit the level of the liquid. The former, however, is far the simplest of the two, and necessarily much quicker in its action in adjustment of any sort being required before reading. To expedite its use still further it is only necessary for a short piece of tube of small diameter to be placed near one end

of the india-rubber hose to resist the oscillation of the liquid, and at each observation bring it rapidly to rest. By this means a levelling can be made almost as quickly as the apparatus can be moved from station to station, and many sights may be readily taken during the time which would be spent in simply getting up the telescope level and adjusting the plate screws and focus. The instrument certainly appears to be a most practical and valuable one, and its easiness of adaptation should make it known in all our mining districts.

COMPRESSED AIR.

VENTILATING FANS.

SIR,—There is frequently much disappointment about the amount of air delivered by fans and the power required to drive them. Thus a fan of a given size on one pit does not give half the quantity which another fan of the same size on another pit gives with the same expenditure of power. I offer a few suggestions how this may take place.

The quantity of air delivered by a centrifugal fan depends on the capacity of the fan, the water-gauge, and the size of the airways in the mine. Thus, suppose the velocity of the fan to give a water-gauge of 4 in., and the water-gauge at the extremity of a long tunnel of the same dimensions as the ear of the fan to be 1 in., then it is evident that sufficient air can not travel to supply this fan. If, however, additional inlets be added so that an additional quantity can get into the fan, it can be filled to its capacity, and discharge more air, and this extra quantity may be delivered at little additional expense of engine power.

In all centrifugal fans, whether there is much air discharged or not, a certain number of strokes are required to keep up the water gauge, and unless the fan discharges air equal to its utmost capacity, so that the air issues at a speed proportionate to the water-gauge, re-entries take place to such an extent that when a small quantity of air is discharged, the work required is almost as much as would be required for the full capacity, because the power is required to prevent the air from re-entering the fan. If the quantity of air then in a mine be short of the quantity that ought to be delivered according to the capacity of the fan and the water-gauge, then to that extent is the fan not proportioned to the work which is required of it, and if under these circumstances another fan of equal capacity and power, that is two fans, be applied to the same mine, the number of strokes of each engine will produce no more air, because the one fan was more than able to discharge the quantity of air, but it will take double the power (minus the quantity employed in discharging the air), because the one engine will be entirely occupied in preventing the air from re-entering the shutter.

I think that if the Guibal case were perfectly air-tight, and the shutter in each closed to the area of the one fan, that the re-entries of the air would be avoided, and the power proportionately reduced. Indeed, if the shutter in the one fan be so reduced that the speed of the air issuing is sufficient to prevent re-entries, then the power needed to drive the fan would be much less. For I think that the sliding shutter acts beneficially in decreasing the area of the outlet, and so allowing the air to be ejected at the proper speed required by the water gauge. In open running fans there are no means, apparently, of reducing the capacity of the fan; and if it is too large for the quantity of air needed it must work at a loss.

R. T. M.

SOUTH AFRICA AS A FIELD FOR BRITISH ENTERPRISE.

SIR,—I can assure you I was very pleased to receive out here the *Mining Journal*. It was like an old friend coming to visit me, and whenever anything interesting to your readers comes across my way I shall, of course, send it to you. My notes are not very extensive yet, but I shall make a point of corresponding with you at least once a month. I am placed here in the very heart of this colony, and although Graaf Reinet is rather a slow going town, one may hear many things interesting and useful. What interests your readers most is, no doubt, the mining prospects of the country. Beyond the copper mines of Namaqualand and the diamond fields, however, up to now there is but little mining interest concerned. The former are very successful; as to the latter you know too well the ups and downs of diamond mining for me to give any special data about it.

Trials of paramount importance are now being made to discover coals. I have now, whilst writing, a sample of coal found in the district of Aberdeen, about 60 miles from here, and I can safely say that the quality is good. It is of the same nature as the Durham hard steam coal. I have been some time ago to visit the district, and I am of opinion that decidedly there is a vast coal-bearing field, extending a good deal further than the Aberdeen district. The seams, however, must be a good deal broken up. One can see there a seam of coal right on the top of the mountain, which undoubtedly has been pushed up there by an upheaval. Now boring operations are going on about five miles from there on the plain of Aberdeen. What is wanted, however, to well test the capabilities of these supposed coal fields is capital. Some three months ago your contemporary the Economist was asking some kind friend for a profitable market for British money, saying that nearly 300,000,000 of English capital was lying idle. My firm opinion is that the British capitalists can do nothing better than turn their eyes towards this colony; and in spite of two wars now going on some 900 miles from here, I can safely say that they will get a fair return for their money. I can indicate several undertakings which would prove profitable. Beyond the Aberdeen coal district there is the Camdeboo and the Stormberg in the east, and it was reported the other day, but I do not believe it, that coal had been found in Kimberly. Then Basutoland, soon to be subdued, is rich in all kinds of minerals. Near by there is the Orange Free State, which fully bears the reputation made for it by a gentleman I may call my friend, Mr. A. Blyth, its worthy council in London. I just received information this morning that some fine specimens of coals had been found in the Buffels river district. I think if a few capitalists were to form a kind of syndicate for explorations on farms with the consent of farmers more coal would soon be found, and collieries would be very profitable. These trial borings could be managed in this way:—There are here, and especially in the Aberdeen, Nunaysburg, Camdeboo, and Middleburg districts—in fact, everywhere—many farms which have no water except what they can store in time of rain, and too often they run short. The farmers would gladly sink wells if they had the means, or rather sufficient geological knowledge, to choose the most propitious spots, and anyone who would undertake to sink a well for any one of them and succeed in reaching water he would be sure to be paid well for his trouble by these farmers. Well, there is no doubt that in such a way and at very little ultimate expense a vast amount of information would be gained, and probably coal and other minerals would be discovered. I saw in your issue of Jan. 1 that a company had been formed called the South African Loan and Mortgage Company. If the directors of that company are wise they ought to strike a course of that kind, coupling irrigation with it, and in a few years they would have a splendid revenue.

Let anyone who would follow my advice communicate in London with Messrs. Legrand and Sutcliffe, the Abyssinian and Artesian well-boring apparatus manufacturers, 100, Bunhill-row, E.C., with my name, and let them communicate with me on the other hand. I have taken especial notice of this water question since I have been here, and I have established a special office for information on it. With the knowledge of geology I possess, and accordingly to the studies I have made of the formation of the ground out here, I can safely predict success to Artesian and other wells in many districts. The farmers out here are mostly ignorant, knowing nothing beyond rearing sheep or ostriches; but if anyone takes the trouble to sink wells for them and procure what they so much require for sheep, ostriches, and may be irrigation, they would pay handsomely.

Another point on which I should draw the attention of capitalists is that of gas-making; not indeed the manufacture of that article from coal, but from water and (say) petroleum oil. There are only two or three towns lighted by gas, and the price of it is enormous. But good gas, made as I point out, would be very welcome for cooking and other purposes, as well as for lighting. Wood is scarce, and consequently expensive, in the Kimberly district, where there are a great number of engines at work; fuel is worth 20s. to 30s. per ton, and coal 40s. There is plenty of water there, so that gas from it

could be easily manufactured. I wish your contemporary, who has special charge of the gas interest, would take notice of this question. There are great profits to be made for both capitalists and consumers. How great would be the boon to people here; for example, if instead of manual labour, which is both bad and dear, they could employ Robey and Co.'s gas engines. I do not particularly wish to receive descriptions of patents touching the manufacture of such gas, for I know well how to make it myself; but rather I should be pleased to receive communications from capitalists, and with the greatest pleasure I should supply them with all possible information. You will, perhaps, say that I have given you a general review of the field of enterprise here, but nothing much about the mining interests proper. Be patient, however, and wait for my next, which I shall not be long before sending. A. VASSARD.

Graaf Reinet, Feb. 19.

A CHEAP SHARE.

SIR,—I have often looked over the valuable correspondence in the *Mining Journal* to see if any observer had noted a cheap share that my own observation had failed to detect, and I am pleased to bear witness of the many disinterested letters I have from time to time noted, and profit made thereby. Now, I think in my humble opinion that the Indian Phoenix is a cheap, if not the cheapest mine share on the market. The manager with his Australian miners has now about returned to the property, and it is known on good authority that great alluvial deposits are on the Phoenix property. When, therefore, the report of their importance is at hand Indian Phoenix will prove with out doubt a most profitable holding. TRUTH.

Gloucester, March 22.

MINERAL WEALTH OF COLORADO.

SIR,—Capitalists and those interested in gold and silver mining will find the following statements of deep interest.

| Official yield of the precious metals for a period of nine years:— | | | |
|--|--------------|---|-----------|
| 1872 | \$ 3,785,000 | £ | 757,000 |
| 1873 | 4,070,000 | | 814,000 |
| 1874 | 5,362,000 | | 1,072,400 |
| 1875 | 5,434,787 | | 1,086,955 |
| 1876 | 6,191,907 | | 1,238,381 |
| 1877 | 7,365,283 | | 1,473,054 |
| 1878 | 9,820,743 | | 1,964,148 |
| 1879 | 16,000,000 | | 3,200,000 |
| 1880 | 24,978,000 | | 4,995,600 |

This yield, taken in connection with the remarkable history of developments in Colorado for the past 20 years, furnishes a solid and reliable basis for forming a correct judgment as to its great wealth in the precious metals.

The following extracts from Fossett's standard work—Colorado: its Gold and Silver Mines—are full of interest:—

Part III., chap. I., p. 155.—The mines of Colorado have produced from 1859 up to date something like \$82,000,000 in round numbers, of which \$10,500,000 were the result of last year's operations. The indications are now good for a yield of nearly \$20,000,000, and perhaps \$25,000,000, in 1879. The possibilities are so great that it is impossible to predict with accuracy.

From p. 154.—The extraordinary developments that have been made and are being made are convincing men from abroad in common with the most enthusiastic mountaineers that Colorado's store of the precious metals exceeds that of any other State.

From p. 217.—The great central mineral belt of Colorado has a width of from 20 to 40 miles, but often branches off to the right or left, and again contracts, so that the breadth is by no means uniform. Continued discoveries indicate that its extent is by no means ascertained. It is impossible to make anything like a close estimate of the wealth that lies embedded in these mountains, where constant development shows that only the beginning of it has been found.

From p. 234.—In seven years, up to the summer of 1878, the adjoining counties of Gilpin and Clear Creek gave a combined product of over \$23,200,000 out of Colorado's total yield of \$35,000,000 for that period. Gilpin gave about \$12,200,000, nearly all in gold; and Clear Creek \$11,000,000, nearly all in silver. They will turn out together nearly or quite \$5,000,000 this year.

From p. 290.—For 20 years Gilpin County has been the leading gold district of Colorado. In that time it has probably turned out more bullion than any other gold mining locality in America.

From pp. 304, 311.—Total yield of the entire Gregory lode, about \$10,000,000; total yield of Bobtail lode to 1880, \$5,138,827.25.

From p. 324.—Quartz Hill (Gilpin County) is one of the grandest depositories of wealth that the world possesses. Here is a network of mineral veins, spurs, and feeders, and a number of great lodes, such as are rarely seen in any country. Millions in gold have been taken from this hill, and there are millions in it yet. The two longest and most reliable of the great fissures are the Kansas, and that known in different portions under the names of Indiana, Hidden Treasure, California, Gardner, &c. These two veins are nearly parallel, but approach one another on the west. The total yield of the hill from first to last has probably exceeded ten millions coin value, and the future annual production is likely to reach a million and a quarter or a million and a half. The Kansas and the California—Gardner—if worked extensively for a mile in length, as they are likely to be, should yield that amount themselves.

From p. 329.—The California—Gardner—Indian vein is one of the most productive in Gilpin County. It has been traced for a distance of over one mile, and has yielded altogether something near \$2,150,000. These figures include the production of the Roderick Dhu and Boston, which seem to be an eastern extension of the Gardner. The Hidden Treasure Mine is remarkable for its large yield and profit, and the size and value of its ore body.

From pp. 330, 335, 331.—The Hidden Treasure's receipts in 21 months \$320,000, over half profit. The Burroughs vein has produced altogether nearly \$1,250,000 coin. The California cleared more money than any mine north of Leadville in 1879.

From p. 243.—A claim only 334 ft. long yielded \$250,000. From p. 352.—The Rough and Ready lode has probably shown the richest ore in the district; specimens have assayed from 14,000 to 21,000 ozs., and small mill runs which yielded at the rate of several thousand dollars a ton. The Forrester and Fremont lodes on Bald Mountain have shown rich ore.

From p. 380.—Clear Creek County. The Tropic has more ore in its reserves than any mine on Scaton Hill. The vein is remarkably continuous, as shown by levels down to a depth of nearly 300 feet.

From p. 401.—The Colorado Central is one of the great mother lodes of the State. Within its walls, which are 70 ft. apart, are four (and in one level five) distinct ore veins or pay streaks, varying from a few inches to 1 ft. in thickness.

Extracts of a similar character and equally strong might be made from Mr. Fossett's book which would amount to a small volume in themselves. Enough has been given to show the unsurpassing value of the gold and silver deposits in Colorado. The great gold and silver belt extends on through Arizona and Mexico, where great appearances exist for profitable investment of capital. F. A. SANDS.

Denver, March 1.

THE CALIFORNIA MINE.—We learn that the California Mine, near Central City, Colorado, has become the property of the California Gold Mine Company (Limited), newly organised in London, with a capital of 130,000l. in 1l. shares. Our friends across the water have secured a much more reliable and substantial property than has generally been the case where Englishmen have invested in America. The California owners have made fortunes, there is one enough in sight now to pay many handsome dividends, and there is every reason to believe that the vein will be found as remarkably continuous for the next thousand feet as it has been in the ground already explored. This is the best paying mine of the rich gold district of Gilpin County—and there are many good mines there. Since first discovered \$35,000,000 have been produced by them, while the present product is nearly \$3,000,000 per annum. There are a dozen great veins and more than a hundred smaller ones now worked. Five of these veins, having several district mines thereon, have each given a product running into the millions. The California with its extensions is one of these five. Since 1877 the mine has been opened in a new place with the shaft and levels of an extent of 1000 ft. each; and has fine buildings and hoisting works. In 1879 the profits were \$102,060 out of a total product of \$165,238, mainly from sinking and drifting without stopping—but all the time adding to the reserves. In 1880 the mine yielded \$184,811-35, with a profit of \$120,756-35. The last time the writer of this article was in the California the ore reserve was large enough to double the above profits for two or more years, if stopping as well as development was prosecuted vigorously. We

believe that but a few years will be required to realise the 130,000, at which the property is capitalised. The Hidden Treasure Mine, adjoining the California and on the same vein, is doing nearly as well. The district containing these mines has about 17 quartz mills with 600 stamps at work. These crush about 140,000 tons of ore per annum, yielding about \$10 per ton. Previous to milling the richer ores are selected from the mass of ore and sold to the smelters—some 7000 or 8000 tons, beside mill tailings, contain an assay value of say, \$1,300,000 or more. For the amount of the investment we think this English company has made the best bargain that can be found in Colorado on any well developed mine.—From the *Daily Indicator*, published in New York.

INVESTMENT IN RUSSIAN BONDS.

SIR,—It is a matter of great surprise to myself and others in the habit of watching the stock markets that the stocks of a country on the verge of repudiation like Russia should command so high a price on the Exchange. I say "on the verge of repudiation" advisedly, as all interested in finance know that in order to meet her payments of interest promptly Russia has had to borrow enormously, and her ability to pay at all must cease with her power of foisting new loans on the markets of Europe. That this power will cease soon is proved by the great difficulty that has accompanied the placing of the latest Russian loans. Then again the accession of the new Emperor brings the country nearer to the verge of repudiation than ever. True, he may be more liberally disposed than his father, and may be more inclined to carry out important reforms; but this disposition is in itself an element of weakness. Reforms are always costly. Taxes must be reduced; public works must be carried on; costly railways constructed; high prices have to be paid to buy old monopolies. In fact, the work of reformation in a country like Russia demands a large supply of money—so that in the present financial position of the country it is more dangerous to progress than to stand still.

It seems to me, therefore, very strange that, in the face of all this, Russian stocks should command the price they do on the Stock Exchange. I know that it is the opinion of many high authorities in monetary matters the present is a good opportunity for realising. No banker or stockbroker of respectability will recommend these stocks for investment. It is time, therefore, that a word of warning should be addressed to British investors not to keep their money in these bonds, as there is every probability that one fine morning they will receive payment for their coupons half in cash and the other half in Imperial apologies. BANKER.

EUREKA (NEVADA) MINING DISTRICT.

SIR,—I beg to communicate to you my usual budget of news from this locality.

Old miners say there is more snow than ore on Prospect Mountain just now. The Richmond Company has immense quantities of lead piled up about the works. Colonel Reilly has laid a good substantial slag crossing across Main-street, from the Ruby and Dunderberg office, which will be appreciated by lady pedestrians. We learn that Mr. H. W. Brooks, who went to Boston some time since for the purpose of disposing of several mines, has succeeded in selling the Albemarle, Dirigo, and Green Seal, and McCoy Hill properties. Let the good work proceed.

Under the management of Maurice Hartnett the Industry Mine is coming to the front again. Something in the neighbourhood of \$200,000 has been extracted from this mine. Rich galena ore has recently been struck, carrying in silver to the amount of \$250 (with some gold) to the ton, and from the experience of the workings of the great mines in the camp bodies of carbonate are immediately connected with galena ores. A large body of low grade ore of a ferruginous character has been discovered, spreading each way under the enclosing rock. The strike of this ore-bearing gangue is north-west and south-east; the dip is scarcely perceptible. The shaft is 30 ft. of an incline, and at that depth a drift is run in a north-westerly direction about 90 ft., and immediately over the ore body. From the bottom of the incline shaft a drift will be run in an easterly direction to the surface, making the workings handy and easy of access for getting the ores to the surface without hoisting. The Industry will again become one of our paying mines.

THE WILLIAMS MINE.—The work of prospecting this valuable Prospect Mountain property is being actively pushed, and a rich strike on one of the lower levels is reported. This is one of the mines of Eureka district that has paid largely from the grass roots, and it is confidently anticipated that it will soon rank itself among the great bullion producers. The recent developments in the Albion prove that the trend of the ledge is into the above property, and that the stockholders are somewhat jubilant. The indications are that it will yet prove a valuable mine. The new machinery of the Albion is now in its place, and will be started to-day; it is of the most approved pattern, and has been put up in a substantial manner. The mine can now be prospected to a great depth. London, March 16. RUBY HILL.

BRITISH MINING ENTERPRISE IN BRAZIL.

SIR,— * * * Mr. Lean's letter respecting Brazilian mines, especially referring to the Desoberta Mines of the Brazilian Mines Company, appears to be somewhat forced, the documents he quotes could be obtained anywhere for the expenditure of a few milreis. I understand that the last man who worked these mines died poor, and the mines were the cause of it. All the great mining families of Minas Geraes are in positive poverty to-day—the Pinto Coehas, the Vazs, the Serranos, da Silvas, the Aranjós Dias, the Faminhos, the Leas, the Marcias of Cuiaba, the Peexotes, Magathais, Cuitierias, and 50 others of other places. The Middle Mine at Itabara has lately been the subject of negotiation for the sum of 50000, the Brazilians having bought back this mine with two others from the late General Brazilian Company for 9000. This mine has been well spoken of, and was believed in by the late Capt. Thomas Treloar. We have lately had some explorations in old mines at Passagem Antonio Periera, San Miguel, and mines near San Jose de Maria Grande, Raposas, and near Congonhas de Sabara, considered by the St. John del Rey Company ground peculiarly sacred to them. At Morro St. Anna they are getting on well with placing the new ram, and probably great results will be obtained this year. At Rossa Grande the same destruction of the company's property is going on which has been allowed by the so-called London direction for years, the plant being used by a foreigner named Burgess for his mines, with occasional sales of it. The splendid woods being destroyed for the benefit of a few Brazilians to plant milho, and shortly the property will have no value. No general meeting of this company has been held in London for years. Why do not the resident shareholders insist on accounts and wind up? Verdad seems to have got at loggerheads with the St. John del Rey Company, and Mr. Tendron especially. There is a good deal in what he says, but still they do give some information at their meetings. Now the St. John del Rey Company has a magnificent mine at Morro Velho; doubtless from the imprudent manner the new mine has been opened since the fire of 1867, the working has become very dangerous indeed, and a catastrophe may happen at any moment; digging a big hole like Morro Velho is not considered mining by either practical or scientific miners. The bright idea of endeavouring to adapt the mine to the old machinery may probably have to be abandoned, and the mine reopened in a miner-like way; of course new capital would be wanted, but it would pay, and that much better than now. Other circumstances look cloudy for the company. * * * As to the case of the Cata Branca blacks, some Rio de Janeiro philanthropists have determined to bring the case before the English Courts for their wages and damages (about 180,000), so that a settlement may be anticipated. * * *

It was announced at a meeting by Mr. Tendron, after the purchase of Cuiaba, that that place was to give 8 oits, or 1 oz., to the ton, but it does not appear to give more than 2½, the outside. It was also announced that the St. John del Rey Company held the entire mining rights. This was either misreported, a misprint, or a deliberate misrepresentation. They have a certain interest in the poorest part of the mining ground at Cuiaba, and nothing more; and even their right to that is, it is said, liable to dispute. If this be so the money which they have spent on this property before getting full possession of it is somewhat astonishing to owners and residents in the neighbourhood, who, of course, are very pleased at it. The subject of iron mines and foundries is now attracting a good deal of attention, and it is not improbable but that something may be done in this direction for the employment of capital.

I may mention that the telegraph is nearly completed between Ouro Preto and Carandahy, which will give direct communication to Rio de Janeiro. Ouro Preto is within two and three days of most of the mines, and this will be a great convenience. The work has been executed under the direction of Mr. Manders, the former highly esteemed director at Morro St. Anna, and assisted by Mr. W. P. Browne. The time is now fast approaching for carrying out the railway concession granted to Mr. Manders in 1872, and this concession may, therefore, be brought before the notice of English capi-

talists. The rail is to give communication from Ouro Preto to the Dan Pedro II. line, and so to Rio de Janeiro. SELEATO. Ouro Preto, Feb. 23.

QUARTZ HILL CONSOLIDATED MINE.

SIR,—I see in last week's Journal a few remarks from Mr. James on the Quartz Hill Consolidated Mine. As Mr. James most truthfully says the hill has been very rich, and especially so the Kansas lode, but profits cannot be expected so quick and cheap now as in years past for the following reasons:—It is characteristic of the lodes in that locality to make as rich at surface as at any deeper point; hence the former workers had but little expense in taking out quartz, and being free from arsenical mundic had but little difficulty in saving 90 per cent. of the gold at the mill, and the water no more than could be absorbed in the quartz, and the whole concern carried on with a little engine of 10-horse power. But now larger machinery is required to keep the water under, and the quartz disseminated throughout with heavy iron pyrites making it very difficult for treatment at the mill, and instead of effecting a saving of 90 per cent. as formerly they do well now to catch 55 per cent. This heavy loss of gold, with extraordinary expenses, put a different feature on things. Reforms are greatly needed from the mine to the mill, but Mr. Fagan not being a practical miner is not equal to the task; and I think the directors would be benefited by sending out a good millman, and also an agent for the mine, one who understands the sorting of quartz closely, for in my opinion nothing pays better than the close sorting of quartz, and should be well looked after. The average price of carriage and crushing is \$40 a cord, therefore it is an important item, and should not be lost sight of.—Camborne, March 25. THOMAS MARTIN.

MINING IN VENEZUELA.

SIR,—I have seen several notices of late in the public journals making mention of difficulty in obtaining sufficient labour in the mining district of Caratal, Guayana, South America. During my experience of some 15 years in the practical working of mines in that district I have very seldom known of any such difficulty or scarcity. A steady flow of immigration has been established for years from the islands of Trinidad, Grenada, Dominica, Martinique, and even as far to the north as St. Kitts and Antigua—a fairly reliable class of labour, and, being British subjects, particularly desirable for the service of the mining companies in Venezuela. There has also been a constant tide from the other States of the Republic north of the Orinoco river, tempted into Guayana by its political tranquillity, its activity in industrial enterprises, and its general prosperity. I can only account for the present reports either on the ground of mistaken judgment in particular instances in handling a new class of labour or some effort to reduce the prices heretofore paid, which has resulted in strikes and temporary stoppages. Certainly the want need only be known to bring thousands at once from the islands to the mining country. At the time of my leaving the district there must have been from 2000 to 3000 English coloured men at work in and about the mines. VENEZUELA. March 19.

SENTEIN MINE.

SIR,—I have been much interested in reading your correspondent's remarks respecting the enquiry made in the Journal as to the dressing machinery and the amount of ore dressed. For some time I held the appointment as agent of the mine; while I was there we had a good mine, and could break more than three times the amount of ore than there was machinery to dress. The lead was so associated that it had to be re-crushed a portion of it the second time to clean it properly. The company sold between 40000, and 50000, worth the first five months' dressing, and we had a large accumulated stock, which for the want of machinery we are unable to dress. Mr. Dingey prepared plans for additional plant, which if carried out I have no doubt the mine would have been a paying concern. There was some delay in getting the second lot of machinery, and that kept back the returns. The additional machinery should show good profits instead of calling up more capital. J. EDWARDS. West Town Mine, Scorrier.

MARBELLA IRON ORE COMPANY.

SIR,—A Scotch mining engineer in last week's Journal recommends English friends to purchase this company's shares, as the prospects of the mine are very promising. Now, I think it would be more friendly to the Scotch shareholders if he had given them the same information and recommended them not to sell at present. They have borne the burden hitherto, and why should strangers come in and reap the reward. There is no doubt the mine is looking very well and the shares much below their value. No one should sell now. Prices will not go lower, and there is every prospect of much higher rates, and that soon. IRON.

DYNAMITE MONOPOLY.

SIR,—The labour of the committee formed to oppose the further extension of the dynamite patent is already showing its beneficial results. The Dynamite Company has issued a circular offering dynamite from the 1st inst. at a reduction of 25 per cent. All interested in mining have reason to be thankful to those gentlemen who have given their time and labour in the cause, and especially to Mr. Waddington, who I believe was the first to suggest the advisability of organising an opposition, and who has worked unceasingly throughout. C. R.

MINE CLUBS.

SIR,—An effort is being made in the West of England by shareholders, mine agents, and others interested in the welfare of miners to place mine clubs on a firmer basis, and to secure help for men and their families in time of need. During the preliminary arrangements Mr. Edward Skewes has written a great deal upon the subject, and last week referred to it in the Journal. His statement that "Observer" is not in favour of mine clubs is a direct misrepresentation, as are most of his remarks with regard to mine agents, and the want of "brain power" in the Cornish miner, &c., on which he for some time past has been dilating. It would be of no benefit to proprietors, mine agents, or miners to enter into further argument with this erratic correspondent. I would merely call attention to the following little episode at the last holding of the Tavistock County Court to show the impression his conduct caused in the mind of the judge. Mr. Skewes is not an impartial authority, as he sued his employers for wages, and the judge, after a full hearing of the case on both sides, without any hesitation, gave his verdict in favour of the company.—March 22. OBSERVER.

CORNISH MINE CLUBS, AND THE EMPLOYERS' LIABILITY ACT.

SIR,—Although I do not consider the Employers' Liability Act is sufficiently stringent to reach one-tenth of the cases in which the employers should in justice be made responsible for the injuries and loss of life which occur among their workpeople, I believe it would be extremely difficult to find anyone who has worked in the metalliferous mines of Cornwall and Devon who would not acknowledge that the Employers' Liability Act is a material step in advance as compared with the doctor and club system.

In its origin the doctor and club system was well enough, but like the cost-book system it has long since degenerated into something so entirely unlike its original, that the sooner both are completely annihilated the better. The representatives of the adventurers are sharp enough in deducting the club money on pay day, but it is an admitted fact that the amount deducted is six or eight times as much as would be charged by a respectable Insurance company to secure the same benefits to the miner. What becomes of the remaining five-sixths or seven-eighths of the amount deducted? Why it is appropriated by the adventurers and carried openly into the mine accounts as profit. Will any correspondent give an instance in which the club surplus has been returned as a bonus to the men who contributed to create it. The entire system is iniquitous, and the sooner it and the cost-book system are swept away the better.

The argument opposed to the limited liability system by Cornishmen is that the adventurers cannot be drawn upon beyond what they were originally told would be ample to make the mine profitable; but once connected with a cost-book concern the unfortunate adventurer finds that he has to submit to a process of periodical blood-letting, which undermines his wealth more rapidly and silently than the least reputable of the limited liability concerns. The fact is Cornwall has not participated in the reforms which have been made elsewhere, the consequence being that she has fallen behind through her mines being stunted for capital and carried on upon antiquated and exploded systems.—Redruth, March 21. REFORM.

PRACTICAL MINING—TREATMENT OF COPPER ORE.

SIR,—In answer to the enquiry by "Espagnol," I would say that starting with the assumption that the copper ores he mentions are tolerably free from other metals, and are carbonates not mixed with sulphides, or only to a slight extent, that he might start a few trials in the following way.

- 1.—The ore to be raised on tribute paid for by ton on sliding scale for percentage contents of pile.
- 2.—Fine crushing.
- 3.—Lixiviation with solution of crude sea salt in revolving barrels, say taking about ½ ton each, a small percentage of acid being added to the brine.
- 4.—When lixiviation is complete, turning into large vats provided with double bottoms in connection with an air-pump. Note the object is to do the work with as little bulk of solution as possible.
- 5.—Separation of copper, &c., by dynamo electricity.
- 6.—Preparation of the used salt solution for use again. For this and also for the density of brine experiments must be made on the actual material.

If water-power is available the whole of these operations are provided for with the exception of a small quantity of steam and hot air. High-street, St. John's Wood. H. J. MORITZ.

GUNNISLAKE (CLITTERS).

SIR,—With reference to the letters that have been published in the *Mining Journal*, I may say that the report and accounts presented at the meeting are in the hands of the shareholders, so that they can judge for themselves as to the future prospects of the mine. For myself, I have increased my interest to the extent of 85 more shares. This, I may say, is after the report of a practical miners' inspection for a party very largely interested in the concern. TAVISTOCK. WM. EDISTON.

GUNNISLAKE (CLITTERS).

SIR,—Having been present at the late meeting of shareholders allow me to contradict the statement of "A Shareholder" in last week's Journal in reference to the Chairman's remarks. The Chairman spoke of dividend mines "in the county" (Gunnislake being in Cornwall), therefore your correspondent's remarks about Devon Consols and Crebor are irrelevant. "Shareholder" says: "What is wanted is an office in London." We want nothing of the sort. What we do want is a boring machine, a new shaft, and some new jiggers, and when we have these requisites we shall be able to treble the present returns of ore, and I have reason to believe that before 12 months have passed the new shaft will be completed. What "Shareholder" says about the smallness of the lodes is simply bosh. He knows nothing about it. It is not true to say that there is no lode near where the bunch of ore was found in the cross-course about a year ago. If "Shareholder" is not satisfied with his investment why does he not sell his shares in this mine and go into Devon Consols or Crebor, which he thinks so much better? ANOTHER SHAREHOLDER.

EAST WHEEL BULLER.

SIR,—If "Present Progressive Age," who writes in last week's Journal, had been a shareholder he would probably have obtained all the information he required by writing to the purser. This is, no doubt, a very fine piece of unexplored mineral ground, as in the ½ mile or so which has to be cross-cut there are well nigh 20 well known mineral lodes, which both east and west of this sett have produced rich mines, and throughout this sett are entirely unexplored, and in a geographical position which is unrivalled anywhere.

In reference to Indian mines, I do not see they have done much yet, although I hope they will. Their work, so far, seems to have been galloping across the country and talking long yarns about the gold they are going to bring home. But most of the gold produced hitherto has been from the coffers of the Bank of England. I fear the Cornish are not progressing with the age in extracting the precious metal from so concentrated a source; and, therefore, they have to cross-cut longer distances and to gather from more scattered sources. I hope "Present Progressive Age" will live until the time he talks of the finish of the present century, and that I shall live to see him, and probably to receive his congratulations on the productiveness of a mine which is destined long before that to give satisfactory results. THE PURSER.

WHEEL GRENVILLE, AND THE "BEARS."

SIR,—Whenever a mine is approaching a prosperous state these gentlemen are invariably attracted to it, and their first business being of course to knock down the shares and then buy. It is pretty generally known, I believe, that this mine has just paid its first dividend, and is about to start a new stonebreaker and new stamps, which is now being added to the existing stamping power. This increase, it is estimated by the manager, will enable them to produce about 50 per cent. more tin, which will bring up the dividend to 10s. per share for the quarter. The gradual increase in the returns of tin have been very satisfactory indeed. In the early part of last year they amounted to only 54 tons per quarter, but reached 104 tons during the last quarter, and the manager stated at the last meeting that there was tin enough discovered to make good profits for three years, even if they made no further discovery during that time, and it is highly satisfactory to find the reserves continue to increase at the same rate. The lode in the bottom, or 190, is opening up better near the shaft than in the levels above, where the tin was only met with some distance from the shaft, whereas in the bottom level, which is only opened a few fathoms, the lode is worth 10s. per fathom, distinctly showing the mine to be improving in depth, as predicted by the manager and many other mining authorities. By extending this level a few fathoms further east it will enter the great course of ore being worked in the levels above, which, with this marked improvement in depth, will enable them, no doubt, to further increase the dividend. As regards the machinery it is nearly all new, and when the new stonebreaker and stamps are got to work will be the best equipped mine in the county. This, of course, has been laid down at an enormous expense, the capital being 6000 shares of 15s. each, or 90,000, but notwithstanding this the "bears," who have been exceptionally busy of late, have got the shares down to about 9s. 10s., or 5s. 10s. discount, and even quoting them lower, but a few who are well acquainted with the mine have had the good sense to take the shares at the low price at which they have been offered by the "bears," and I have no doubt at the next settling they will find the shares have advanced considerably, and that they have been caught themselves in the trap they set for others, a just retribution, which could always be inflicted if parties would combine against them; and I sincerely hope all interested will join and buy up these exceptional cheap shares while they have the chance.

A short time ago they endeavoured to frighten people out of their shares by saying the late fall of snow was likely to flood the mine. It is now all gone, and the manager reports that he manages the water easy with the engine going a little over half speed. This is a new engine, and capable of keeping all the water in the mine for the next 20 years. At the last meeting 750s. was carried forward in favour of the company, with the cost charged up close; in fact, I believe a fatter than any other mine in the county, striking an actual—not a fictitious—balance between revenue and expenditure, and in this respect is an example to the Cornish mines. Of this balance the manager at the last meeting said the new machinery would absorb

500% to complete it, leaving a cash balance of 250% in favour of the company, with the mine thoroughly equipped with first class machinery, the expenditure for which is now happily at an end, and the profits will now be available for dividends. The new stone-breaker and stamps will have five or six weeks' run in this quarter, so that the slight deficiency caused by the snow, and of which the "bears" are making so much, will be more than compensated by this great increase of power, and the mine will no doubt make a very good dividend next time, and a much better one the following quarter, having now been brought into a thorough dividend state, and its attraction of the "bears"—as they are ever attracted by sweet things—is the best proof of this probably, and I have not the slightest doubt that at the next settling we shall have trapped a nice little flock.

March 22.

WITNESS.

THE CALLINGTON DISTRICT, AND ITS MINES.

SIR,—It is gratifying to see the great change that has taken place here in the mining interest within a few months. Almost every week we see new-formed companies starting the abandoned and other mine properties. The Callington Consols have commenced in right good earnest, and no doubt will be thoroughly opened out and developed. With three such splendid cross-courses as they have going through their sett, if they do not find large courses of ore near them, both tin and copper, it will be an exception, as we have always found the richest bunches of ore near the cross-courses in Holmbush and Kelly Bray Mines at the north of their extensive sett; and I have every reason to believe that where these cross-courses cross the silver lode large deposits of silver will be found.

Kit Hill Great Consols Company have also commenced operations, and early returns from both of these mines may be reasonably expected. The change so great in town within 12 months is really quite surprising. There are but very few people here that would have accepted a share as a present in Dolcoath 12 months since. Now they have started Wheal Luskey and Trevartha, and it has become quite a common thing for them to pay down 100% or 150% to a hand for shares in other mines in the district. The Silver Hill Mine, I understand, is about to commence operations in a few days.

Callington, March 24.

J. BUCKINGHAM.

ROOKHOPE AND NORTHERN MINES.

SIR,—I think your correspondent "Bristo," in last week's Journal, deserves the thanks of the shareholders of the above mines, and of mining shareholders generally, for his criticisms respecting the manner in which these mines were wound-up and reconstructed. As a shareholder I can corroborate his statements, and have often wondered why the information he desires was not forthcoming. The statement that the application for more money met with no response is not correct. I paid up my proportion to the mortgage loan in June, 1879, and only had my money returned in November of last year, and then only the bare amount paid, and not the amount which ought to have been credited to me. I am not sanguine, but I certainly feel aggrieved at not being granted shares in the new company in respect of the same, and also in failing to receive any intimation that the mortgage loan had fallen through until long after the new company was formed, in which I had taken some shares. B. B.

MINING IN THE ST. BLAZEY DISTRICT—No. 8.

SIR,—Looking at the run and character of the lode in Mount, Scobels, Wheal Maullin, and the mineralised outcrops about St. Andrew's Bridge, and then those again appearing between the railway station and the road leading from Little Par to Tywardreath, it is very difficult to conceive a piece of ground more entitled to be considered a sound speculation than the resumption and re-working of the Par Green ground.

Capt. Barratt was just as lucky in abandoning this enterprise as he was when he became author of the "Towpenny Hill." It was said that Capt. Barratt was acting for Messrs. John Taylor and Sons when he sunk the shaft there. I should like to see a great firm like theirs resume the working upon an adequate scale under the management of such a man as Capt. John Paull, of Llangollen Quarries. I often wondered why a man of his great experience and ability should be buried there at such common place work.

London, March 17.

A MINER.

THE MINING COMPANY OF IRELAND.

SIR,—I am sorry to see this once flourishing company dwindling to a span. The cause of this falling off in the once great and much respected company is too patent to the most superficial observer to require stating, where the whole field almost is their own, and where there exists such an opportunity of not only retaining their own but of making further and yet further progress year by year by extending their outposts. It was the quiet opinion of Capt. John Clemes, one of the company's agents, that it would continue to sink and sink until it became extinct, if not arrested, by the appointment of a thorough mining captain to the post of secretary and general manager. We often discussed this matter many years ago, for in that opinion I fully concurred. By a proper selection (unaided by Aunt Betty) there would be no difficulty in finding a head quite adequate to the management of the commercial business of the office, one as conversant with mining theory as the great and distinguished Sir Robert Kane (one of the present directors) could possibly be, and, moreover, able to check the management at every point, advise and confer with the agents and managers, and watch the company's interests in a manner that would be impossible for any one of less qualification. An inferior agent or one bent on misguiding the company might destroy it by taking a non-mining secretary off the true scent. What I mean by a non-mining secretary is one who has not graduated in the bowels of the earth as a thorough practical miner. It is true an expert and gifted mind may soon pick up a good deal of useful mining knowledge at the enormous expense of the company, and non-practical mining directors may really think them clever. But those who know better shudder at such appointments, where only the most superlative ability should stand in the interest of the shareholders.—London, March 18.

A MINER.

GREAT DYLIFFE MINES.

SIR,—I have just returned from a visit to Montgomeryshire, and having inspected the discovery lately made at Dylyffe, I think probably those of the shareholders who read your valuable Journal would like to hear the latest news about their property. The "New Lode" at Dylyffe is entirely independent from the three other lodes, from which the returns have hitherto been made; but, although known for some few years past, it has never been worked beyond having a short winze sunk in it to prove its value. It is approached from the adit level, by which it is intersected, and from which it can easily be worked. The original idea was to drive a cross-cut from one of the levels in the Llechwedd-du engine-shaft to intersect it, and work it from that shaft; but this would have been an extremely expensive operation, as the cross-cut would have had to be driven about 70 fathoms. The managing director, however, in the course of one of his visits last year, discarded this idea, owing to the great expense; and, instead, determined to stoop up to surface on the hill from the top of the winze, a distance of about 15 fms., and so form a new shaft, which could be connected with one of the large water-wheels. Soon after commencing this stoep, the lode, which showed only a very thin string of ore across the adit level, opened out to a solid rib of lead ore 6 in. thick, and in one place forming a bunch 12 in. thick. I saw the men taking down the lode in this stoep, and it certainly was a very splendid show of ore.

The result shows the wisdom of the present company in commencing the work in a practical and straightforward manner, as the ore cut will pay the cost of making the shaft, and the shareholders will, in consequence, have a new mine on what is proved to be an exceptionally rich lode. The local agent hopes that in about three months this shaft will be cut through to surface; and as all the necessary machinery is ready, the connection with the water-wheel will then be made, and the water cleared from the winze, which is sunk 15 fms. on the lode, and from which ore similar in width to that now being cut above was taken during the sinking. When this is

clear the shaft will be sunk on the course of the lode, and if the ore continues to improve in the deeper ground as it has done in the parallel lodes at Dylyffe, the work will practically cost nothing to the company, as it will be paid for by the ore raised while sinking. There is a lot of work being done on the Llechwedd-du; I was shown several very good stoeps by Capt. Evan Evans, who has been on the mines for 30 years, and told me many curious anecdotes of the varying character of the returns of ore from the several points at different periods, at one time reaching 300 tons per month. Capt. Evans has every expectation, now that the present is a new turning point in the history of the mine, and that the grand discovery on the new lode is the foreshadowing of a return of the palmy days of the old Dylyffe.

OTTER.

KILLIFRETH MINE.

SIR,—Allow me to endorse and support the letter of "Shareholder" in last week's *Mining Journal*. I too, as a large holder of shares in this mine, have been much disappointed at the continual heavy calls and great outlay made by the managers with so little result during the last two years or more. I have not lost faith in the mine yet, but I do think that the expenses should be at once reduced, and the explorations confined to those points of the mine that are giving indications of early success. When I compare the manner in which such mines as New and West Kitty are managed, I certainly think we have reason to complain that more regard is not paid to the wishes of the shareholders, and unless some deference is shown to the opinions and desires expressed in this matter I for one, although absolutely unknown to "Shareholder," shall be prepared at the next meeting to agree to some change in the management whereby we shall have more consideration shown to our pockets, consistent of course with the proper development of the mine at the least necessary expense.

ANOTHER LARGE SHAREHOLDER.

KILLIFRETH MINE.

SIR,—"Shareholder" in last week's *Journal* may, I think, receive fresh encouragement from the last report in the mining correspondence coupled with the one sent out to shareholders. It may be as he says quite true that too much attention has been given to working on the shallow levels instead of sinking, and so testing the property in depth, but it seems the management are fully alive to the importance of going deeper, but this means probably, if carried on at several places, a considerable outlay; and to save shareholders' pockets the agents appear to have concentrated their attention on one or two points in the matter of shaft sinking, and so far with fair measure of success.

The somewhat discouraging (as rumour has it) report of a mine captain thereon (and it is believed in the interests of a well known mining speculator of somewhat fussy reputation, and who has relinquished his shares, having his hands pretty full for his means) of other stock, may serve to damp your correspondent's hopes as to the future, but I trust he will not allow any croakers to frighten him out of his holding, but hope he will still see his way to stand by the speculation, as there appears to be an improvement generally, and if this goes on, of which there is every expectation, means may be afforded without the requisite strain upon shareholders' pockets to enable the management to re-work other portions of the property now probably flooded, and consequently more or less costly to work, unless the resources of the mine itself enable such work to be done.

The latest report seems certainly very hopeful. Perhaps some of the costs may be reduced as "Shareholder" suggests with advantage, but still caution must be exercised therein even in these days of economy; and the pursuer appears to be a careful man, and perhaps he is the best judge of what is wanted.

If the efficiency of operations were at all affected by such saving, why it would be possibly highly injurious to the mine for time on, and therefore it may not be good policy to curtail further than has been done. Like "Shareholder" I should be glad to see more frequent reports in the *Journal*.

London, March 17.

ADVENTURER.

BWLCH UNITED MINES.

SIR,—For a long time past the working of this mine has been carried out in such a manner as cannot but prove most unsatisfactory to the shareholders, and I believe to the directors as well, besides giving but little employment to miners in the neighbourhood, as was fully anticipated at the starting of the mine. I must confess that I am not greatly surprised at this, for, judging from the very scanty reports which have occasionally appeared in the *Journal*, very little work has been accomplished underground to achieve success, and that little, in my humble opinion, not calculated to lead to any lasting good results.

Let us for a moment examine what the mine did in former times. I remember it having returned as much as 130 tons of ore in one month, and nearly 100 tons a month for some years after. This ore was all gotten between Doran's shaft and the boundary between the Goginan and this property, being 75 fathoms in length. This course of ore produced thousands of tons down to the 50 fm. level, and I am informed and believe the deeper levels, although shafts have been sunk to the 100, have never been driven through this rich ore ground to prove whether this great course of ore is exhausted or not. To the east of Doran's shaft the main lode has never been seen if it has not been cut by a cross-cut driven north at the 40 fm. level; but this is very doubtful, as if it had been cut it would certainly have been driven on even if it were poor, as there would remain and there exists at the present moment a piece of untried or virgin ground for more than 200 fms. long from Doran's back to the eastern boundary between this property and Cae-Nant Mine.

Seeing that the Goginan deep adit, which is 120 fms. deep from surface at the boundary shaft, is almost driven into this mine arrangements might undoubtedly be made with the new company about to start Goginan for its continuance into the Bwlch United. If this could be accomplished and the deep adit pressed through on the Goginan and Bwlch main lode it would undoubtedly lay open the finest and richest course of ore discovered in the district since the starting of Goginan; but the upper section of the main lode should be proved immediately, where there can be no doubt very rich courses of ore would be found, as well as the ground tried under the 50 fm. level from Doran's to the western boundary.

There is no want of capital to carry out these trials, and, therefore, a little energy and judgment are only wanted to make this property by far a richer property than it has ever been, and one of the most profitable mines in the Principality.

ABSALOM FRANCIS.

Goginan, Aberystwith, March 23.

MINE REPORTS.

SIR,—I have often wondered why it is that reports on many of the Cornish mines never make their appearance in the *Mining Journal*. Surely the shareholders would like to know weekly or fortnightly how their properties are looking; but in many cases their only opportunity of getting reliable information is at the quarterly or four-monthly meeting. In the meantime, important changes may have occurred, and only those living in the immediate locality of the mines, or who have friends there, have the means of knowing what is going on. It is obvious, therefore, that local shareholders have, under the present system, an unfair advantage over those at a distance. It is not unusual for an anxious shareholder to be startled by an important fluctuation in the price of his shares, but he must wait patiently until the next meeting—perhaps three months hence—before he can be enlightened as to the cause. If Cornish mining is to be made attractive to the general public there must be less reticence as to the condition of the mines, and the distant shareholder must be placed on an equal footing with the local shareholder. I feel sure that if the practices adopted by so many mines of publishing weekly or fortnightly reports were followed by all, the shareholders would appreciate the change, and no harm would be done to Cornish mining.—London, March 24.

J. G.

BEDFORD UNITED.—The sinking of the shaft on the Bridge lode still continues in a good course of black and grey ore, and preparations are being made for driving east and west on the lode. Seeing

that there is nearly a mile of unexplored ground, the lode improving in depth, and that appearances are similar to the Marquis lode, which returned between 60,000, and 70,000, in dividends, there cannot be much doubt but the shareholders have a valuable property in their hands, and any persons seeking for a permanent investment would not do amiss to take advantage of present prices and secure an interest, as two or three months hence will in all probability see the shares quoted at a figure considerably beyond that now given in our list.

REPORT FROM CORNWALL.

March 24.—We have little to report this week except a steady, if slow, improvement in mining prospects, and in the general conditions under which it is carried on. If we have had a severe winter we appear not unlikely to have an unusually favourable spring; and there is an evident disposition to speculate quite as freely, if not more freely—just for the time—in the shares of old established mines as in the new ventures, which in the very varied promise have cropped up on every hand. There is clearly a fair amount of capital available in speculative hands, and if the quantity of share dealings is thereby stimulated at times beyond the capacity of the market, and prices run up and down abnormally, still the tendency is upwards in the long run, and the very extent of the operations indicates the return of that confidence for the want of which we have so long been suffering.

The dues question is exciting so much interest just now in several quarters in connection with the demand of a 15th at Dolcoath that it does not appear as if there would be any great difficulty in getting the whole affair thoroughly discussed, and perhaps some definite action taken, if only the Mining Institute, to which we must look in such a matter as this, would lead the way. An important preliminary would be the preparation of statistics, showing how the rates of dues vary in different mines and in different localities, and the way in which adventurers were met by mineral lords during the depression. Figures as to the rates charged in new sets under competition or otherwise would also be of value. We do not believe that any course will be really satisfactory not based upon fair rent and compensation as regards surface, and percentage on profits as regards ore raised, but we cannot expect this view to be accepted until the whole subject is thoroughly thrashed out, and its incidence explained. There is no matter more important in regard to mining just now.

It is a very encouraging sign to find that every week brings new mining ventures into the field, the great majority of which at the very least are fair subjects for speculation, and many with adequate management certain prizes. One thing must be borne in mind which is not always recognised, and that is the fact that the conditions of mining operations have so changed of late years, and especially since the introduction of the boring machine and of the stronger explosives (but the economy is seen in all directions), that old mines which could only pay their way ten or twenty years ago, can now, with the same returns, yield handsome profits. The extra demand for labour will of course put something in the other scale; but the main fact remains true for all that, and many a mine abandoned by the past generation, not from want of mineral but cost of working, will under present conditions give large profits on the economy in working alone, not to reckon the additional profits derivable in numerous cases for the utilisation of minerals formerly neglected.

TRADE OF THE TYNE AND WEAR.

March 26.—The weather has continued moderate, and there has been great activity in shipping. The shipments of coal at Tyne Dock have averaged 18,000 tons per day, and those at the spoons on these rivers and at the various docks have been proportionately large. The general export traffic continues light, but some steamers for Gothenburg have sailed with coals. The Queen of the North has taken a large cargo of steam coals for Genoa. In the Northumberland steam coal district, however, there has not been any favourable reaction. Very many of the pits have been again on short time, and the result of business in this trade over March is disappointing. As many steamers are expected to arrive early in the week to load steam coal a much better business is anticipated, but there is no doubt that until the Baltic is fairly opened there will be no material alteration in the position of affairs.

The demand for house coals has moderated considerably, the London and all the coasting markets being amply supplied; the home demand, however, continues fair. The demand for coke for export is improving, and there is no falling off in the demand for home and inland. Small and manufacturing coals are getting scarce owing to the reduced quantity of large coal made, and the price is of course increasing.

The damage done by the boiler explosion at Seaton Burn Colliery is being rapidly repaired, and it is expected that coal work will be again resumed on Thursday. The inquest on the bodies of the men killed was opened on Wednesday, and the evidence of the engineer and the man who had charge of the boiler and others was taken. Seven boilers were at work on the morning of the explosion, and all of them were provided with proper safety-valves, indicators, and water-gauges; there was nothing to show any defect in any of the boilers, but the No. 1 boiler, which exploded, did leak a little on the morning, and when the engineer's attention was called to this he examined it and concluded that there was no danger from such a slight leakage. The inquest was adjourned until Wednesday (this day).

The Iron Trade appears to puzzle many of its members at present, and various opinions are expressed as to the future prospects of it; the make is of course, very large, and the price low. Shipments are, however, increasing, and with finer weather may be expected to increase. Lately shipments have been at the rate of 70,000 tons per month, and with an increase upon that, which may be expected, stocks ought not to increase materially. There is, however, uncertainty, and consequently lack of confidence, and dulness. Pig-iron has been offered pretty freely this week at the low prices quoted, both by merchants and makers, yet buyers have not responded freely. The manufactured iron trade is also dull, and prices are getting lower. Ship-plates can be readily bought at 6*l*. 5*s*.; bars, 5*l*. 5*s*. to 5*l*. 7*s*. 6*d*.; and angles about 5*l*. 7*s*. 6*d*.

At Middlesbrough, on Tuesday, there was an extremely dull and quiet market; there was a good attendance, but little inclination to do business, quotation for No. 3 at the highest 38*s*. For forward delivery very little business is doing. Messrs. Connall's stocks at present are 156,976 tons, being an addition since last Tuesday of 1610 tons. Warrants are about 39*s*. No. 3 net. The shipments of iron from the Tees last week were better, but the deliveries of manufactured iron were restricted; in both, however, a steady improvement is looked for with the advance of the season. Scotland is taking a considerable quantity of Cleveland iron, and the shipments to the Continent have been larger consequent on the finer weather. A much better condition of things is expected next month when the Baltic is opened, and spring trade generally.

The shipbuilding trade, on which the manufactured iron trade is so largely dependent, shows some improvement with better weather. Many firms in the north-eastern shipyards are booked some months ahead, and plenty of new work is coming to hand in the Tyne and Wear, and the lately projected new works and extensions are being rapidly pushed forward. A screw steamer of about 2200 tons was launched a few days ago by Messrs. Schlesinger and Davis, for a Cardiff firm. The new steamer, Huntingdon, built to the order of M. Milburn and Co., has also been launched by Leslie and Co. This steamer is to carry 3200 tons, and she is very strongly built with the latest fittings and improvements. Upwards of 30 vessels, many of them of large size, are in course of building on the Tyne, including in the number four gun-boats. At the Jarrow Works of Messrs. Palmer four mail-boats are to be laid down shortly, and each will be 400 ft. in length. The extension of the engineers' and smiths' shops at those works is being proceeded with. The extension of the engineering works of Messrs. Hawthorn, of Newcastle, at St. Peter's, is to include the whole of their plant for the construction of marine engines and boilers, is being proceeded with rapidly. The erection of the North-Eastern Marine Works at Wallsend are also proceeding.

It is expected that the Ouseburn Engine Works will be taken over by a new company shortly, who will with additional capital greatly extend the works and the operations at them. Engineers and founders generally are well employed, and some engineers are extremely busy; it is said that Messrs. Hawthorn, of Newcastle, have got an order this week for 20 locomotives.

There are abundant signs of the prosperity of iron shipbuilding on those rivers, and the trades connected with this very important business and some other trades are moving at a steady pace, but the general feeling about trade is dulness. This feeling had commenced before the tragic death of the Emperor of Russia, but it has been much intensified since that time. There is a general feeling of uneasiness on the Continent, especially in Germany and Russia, which has begotten a sense of uncertainty and want of confidence, and general trade is certainly without vigour. The value of coals, chemicals, and merchandise generally is unchanged. Several steamers have arrived from the north-east, some of them having been ice bound several weeks.

The Danish coast is nearly clear of ice, but some time must elapse before the Baltic and the distant ports are opened. When this is effected there is no doubt whatever that it will give a considerable impetus to the general trade of this district, but that it will cause a generally active trade is not at all expected. In order to effect this there is little doubt that the political atmosphere will require to be cleared, and the repeal of the hostile tariffs of other countries is very urgently required. A very large trade has sprung up between the Tyne and the American Continent, and regular lines of steamers now run direct between the Tyne and New York, and other principal ports on that Continent, but this trade would have vastly extended if the hostile tariffs alluded to were repealed or modified, and the same remarks apply to Germany.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

March 24.—No improvement can be reported in the iron trade, and the gatherings on 'Change in Wolverhampton yesterday and in Birmingham this afternoon had a decidedly dull tone. All pig-iron, but the melting quantities were neglected. Local melters were to be had at 27s. with delivery well on towards the last quarter. All mine pigs were to be bought at 3s. 2s. 6d. down to 3s. for the blast quantities; cold-blast were 17s. in advance of these figures. The manufactured iron trade was depressed, and buyers will now mostly postpone purchasing to any large extent until the quarterly meetings, which will be held in Wolverhampton on April 13, and in Birmingham on the following day. What course prices will then take is altogether doubtful. Boiler-plates were this afternoon from 8s. to 9s., according to brands, and sheets (singles) 7s. 5s. to 7s. 15s. Tin-plates were less neglected. High qualities were in demand for United States, Germany, and Australia. Furnace and forge coal was in slow sale, with prices rather easier.

A petition for liquidation was yesterday filed in the Walsall County Court on behalf of Mr. David Rose, ironmaster, of the Albert and Victoria Works, Moxley. Mr. Rose has found that his last year's dealings have resulted in a loss of 2600l. Though he has made no bad debts, and is not being pressed by creditors, he is unwilling, in face of the actual and prospective depression in trade, to continue business any longer. At a private gathering of his creditors on Monday the liabilities were shown to be 30,819l., and the assets 28,738l. An offer of 12s. 6d. in 17s. guaranteed, was refused. The first meeting of the creditors is fixed for April 11, at the Queen's Hotel, Birmingham. By the closing of these works several hundred men will be turned off.

The Wombridge Iron Company, of Shropshire, have suspended payment, and a meeting of creditors has been announced.

The South Staffordshire Mill and Forge Works Board are soon to lose their president (Mr. Richard Chamberlain, the Mayor of Birmingham), unless he reconsiders his decision. That gentleman has expressed to the board his intention to resign the presidency on account of the increasing demands upon his time made by public work. He, however, expressed his willingness of hearing the pending dispute on wages if he was desired to do so by both masters and men. The operatives have replied asking him to reconsider his intention, as the calls upon his time will not be so frequent now that the sliding scale has come into operation. They express a desire that he should adjudicate upon the coming question. The employers will, doubtless, express similar views.

At a meeting of coal masters and working miners of the Bloxwich district, held at Walsall, on Monday, it was agreed to put the district again under the operation of the Birmingham agreement for the regulation of wages, and a proposal was made to establish a permanent relief fund to meet accidents of all kinds occurring in the collieries instead of leaving compensation to be sought under the Employers' Liability Act, the employers to contribute one-fourth of the gross contributions of the workmen. This proposal was ordered to stand over for a further consideration on matters of detail. The principle it involved was approved.

REPORT FROM DERBYSHIRE AND YORKSHIRE

March 24.—There is no change to report with respect to the state of affairs in the lead mining districts, the weather being now far more favourable for operations than for a considerable time past. It is, therefore, to be hoped that production will go on increasing, and the output for 1881 will contrast favourably with past years, and for this there is plenty of room, for the progress made during the last decade has been far from what it should be, for although the Derbyshire lead mines are about the oldest in the kingdom, having been worked by the Romans, there are still considerable reserves of lead in the county that will well repay working, where such is done with spirit backed up with capital. At the village of Eyam of late there has been a couple of landslips, caused no doubt by the ground having been excavated by miners, for a large quantity of lead has been obtained in the village, whilst operations are still going on. The Coal Trade, more especially in the northern part of the county, has been brisk, owing to the late dispute in Lancashire and South Yorkshire, but these having been settled business has become of a steady character, but at the same time it is even now sufficiently good to keep the collieries well employed.

For several years past a large trade in coal has been done with London by many of the principal coalowners in the Chesterfield, Eckington, Staveley, and some other districts; and, thanks to the moderate rate charged by the Midland Railway Company, they have been able to maintain what may be termed an exceptional position, so that last month Clay Cross alone forwarded to London 26,500 tons; Eckington, 15,000 tons; Grassmoor, 14,600 tons; Langley Mill, 13,800 tons; Blackwell, 10,400 tons; Pilsley, 11,000 tons; and Staveley, 7400 tons. The greater part of the coal sent was for household purposes, as inland coal for steam vessels is scarcely known on the Thames. Were the proposal of Mr. Thompson to send the coal from the Midland field to London by way of Boston Deepes carried out, then the fine steam coal that permeates the entire field from Nottingham to Barnsley would soon make its way, seeing that it would bear comparison with either the North Country or the Welsh steam coal, the trifling drawback being that it makes rather more smoke, a fact which in case of war would be a consideration in the Navy, but at the other times would be of no consequence. Steam coal, however, has been quiet for a considerable time past, but it is now reviving, and with the advent of fine weather will no doubt become brisk, seeing that the shipping season is fast drawing near.

Engine fuel has gone off somewhat briskly for Lancashire, but the market cannot now be looked forward to, seeing that the pits in the different localities are now able to supply the wants of manufacturers. Makers of coke have been doing well, greater care than formerly being now taken in its production. At the ironworks business is still of a moderate character both as regards pig and rolled iron, but some of the foundries are favourably off for work. At the Dronfield Steelworks the output of rails is still heavy, and it is said the firm have received a part of the large order given by the Hull and Barnsley Railway Company for rails.

In Sheffield most departments are favourably off for work, but there are two or three branches in which there is not that briskness

there was earlier on in the year, as few orders of late have been received from Russia for material of any description. America has sent some few orders for knives as well as for plain crucible steel, whilst Australia is taking largely of steel rails, railway material, and general hardware. At the Atlas Works they have been turning out on a large scale the new steel-faced plates for the Admiralty, as well as rolled iron generally. Steel rails are in such request as to keep the leading establishments fully going, but prices are not so high as they were, for competition appears to be running high, and many firms formerly engaged in the making of iron rails in the North of England and Wales have now entered into the steel rail trade. Ordinary iron ship-plates have been in fair request, but there is a growing demand for those made of steel, seeing that the same amount of strength is obtained with a much thinner plate, so that steel in reality will be found to be cheaper than iron. Makers of crucible steel are better off than they have been, and a good deal is now being absorbed for structural purposes, as well as for cutlery and other Sheffield goods for which such steel is required. Railway material, including axles, springs, tyres, wheels, and points are still in good request, and railway wagon builders have also been favourably off for business. Cutlery houses engaged in the manufacture of the best qualities of table and other knives have been kept well going, but inferior goods do not go off so well, having to meet the competition of the German and other foreign makers.

In South Yorkshire most of the miners have gone to work, the strike having collapsed in the most complete and thorough manner. The trade in coal, however, is far less active than it has been, and so far as household qualities are concerned it is likely to get worse. Steam coal, however, is looking better, and with the expected early opening of the Baltic will still further improve.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

March 24.—In the hope that it will be of interest both to your correspondent "Llanarmon," and to many other readers of the Journal I will this week give a general description of the mineral-bearing limestone of Denbighshire and Flintshire. From the village of Llanymynech, six miles south of the town of Oswestry, a belt of limestone beds stretches northward by Chirk and Llangollen to Minera, Llandegla, and the head of the Vale of Clwyd. At this point one branch of this belt runs northward by Llanarmon, Mold, and Halkin to Holywell, and skirting at a little distance the estuary of the Dee, bends westward until it is connected near the famous Targoch Mines with another branch that fringes the east side of the Vale of Clwyd. On the west side of that vale there are nearly continuous developments of the same limestone, which gather strength towards the town of Denby, and stretch across the country to Abergele Colwyn—the Great Ormes Head—and re-appearing in Puffin Island and along the Menai Straits. The whole of these limestone beds are divisible into three great groups stratigraphically. The first and lowest consists of thick bedded compact white limestones. The second or middle is a series of thin beds of greyish, sometimes pink and yellowish coloured, limestones, divided by thin partings of shale. The third and uppermost consist of thick beds of dark blue or grey limestones, which are divided by thick beds of black shale. It will be necessary for my purpose that I should add that above the third or uppermost group lie thick beds of sandstone and grits, with two principal intercalated beds of limestone. This series so far has been classified as belonging to the millstone grit. It may be found, however, to have more affinity with the Yoredale rocks or upper limestones, shales, and sandstones of the North of England. The whole series I have described has an aggregate thickness of from 500 ft. in the southern to 1200 or 1500 ft. in the northern part of its course. The belt is traversed all along its course by numerous cracks, faults, and fissures or cavities. Of the faults which are simple cracks of shrinkage nothing much need be said, and that not just now. The faults run in two main directions—first, north and south; second, east and west. Of the north and south faults some are of great length. There is one that extends from near the village Llanarmon right away to the sea, with numerous parallel ones of shorter length. Some of the east and west faults are also of great magnitude. I may instance the one that runs down the valley of the Dee, and also the great Minera fault. These east and west faults are of more recent origin than the north and south, inasmuch as they displace the latter, together with the great mass of the limestone, to a great extent, and run into the overlying coal measures. They are, however, overlaid by the New Red Sandstone, and are consequently of greater antiquity than the deposition of the beds of that formation. I will resume this description next week.

I am glad to see the nice set of machinery at the Talybont Mines in work again, and trust that the revival of this mine in connection with the Alttyrbib Mine may be of more than a temporary nature. The Pwll Roman Mine is turning out some nice samples of copper ore, while at its neighbour, the Bryn Dyfi Mine, a splendid run of lead has occurred some 10 fms. long, and carrying in places some 2 ft. of solid lead. I hear that there is some prospect of the Penpompren and Penybanc Mines being re-started, and to these and to the other mines mentioned I heartily wish success. The Frongoch Slate Quarry, which is situated about three miles from Aberdovey, is in liquidation, and a sale of all the plant and machinery is announced for the 24th. The Abergynolwyn Slate Quarry has been sold to a Mr. M. Connel for the sum of 18,000l.; this sum does not include the stock, loose stores, and plant. The quarry is situated at the south-west end of the Corris district, and is connected with the Cambrian Railway at Towyn by a tramway. The colliery proprietors in this district have great difficulty in maintaining the rise in price of coal which occurred during the winter, and the prices are now as a rule weaker, and the sales less.

PATENT CORF WHEELS FOR MINES.

During the last few years a great deal of attention has been given by the makers of crucible steel in Sheffield to produce corf wheels and axles, so simply constructed that they could be put together by any person in a very short time, and at the same time be so durable as to be more economical than the old iron wheels and axles. Amongst those who have been most successful in producing an exceptional steel wheel are William Jessop and Sons (Limited), of the Brightside Steelworks, one of the largest concerns in the kingdom. The construction of wheels for underground work has undergone many changes. With a broad wheel the amount of friction, especially on a wooden way, was very great, much greater than with the same wheel on an iron way; but the working of the rubbing surfaces was somewhat diminished by the adoption of the sharp-edged wheels. There are three sources of friction resisting the motion of all carriages moved on railways with wheels—contact of the periphery of the wheel with the rail, the attraction of the axle, and the oscillation of the load. The resistance due to the friction of the periphery of the wheel is lessened by diminishing the breadth of the wheel's periphery, or by adopting round top rails with broad wheels, or by increasing the diameter of the wheels. Owing to the increased strength which is attained in the construction of broad wheels over those with sharp edges for the same weight of material, and the more effectual reduction of the resistance of friction by the adoption of the round bridge rails with the broad flanged wheels, the system has been adopted in most large mines, the wheels, of course, being of the ordinary iron type. The steel wheels, however, run smoothly, there being little or no friction and consequent wear. In the making of such wheels the steel is of the toughest description, and such as offers the greatest resistance in wear and tear, so that there can scarcely be any breakages or repairs, as is the case with iron wheels.

Another object attained by the steel wheels is the decrease in the weight, which allows of an increase of haulage with the same amount of power. The advantages claimed for JESSOP'S wheel for securing them to the axles are simplicity of construction, few loose parts, and the ease and rapidity with which the wheels can be taken off and replaced securely on the axles, a great desideratum in the case of a broken wheel. The gripping action of wheels made according to the invention may be compared to the grasp of a hand, the boss of the wheel contracting round the whole surface of the periphery of the axle, and not bearing on two or three points only,

as is generally the case where the wheel is secured by a key or a nut. It may be seen that the boss of the wheel is not cast solid, but has a space or keyway cut through it into the centre hole; when, therefore, the nut of the bolt near the centre is screwed up tightly it draws a lug opposite towards the arm, and contracts the diameter of the centre hole, gripping the axle with immense power. All that is necessary to release a wheel is to unscrew the nut when the boss of the wheel expands, and the wheel may then be removed. To make any movement of the wheel or the axle, either lengthways or rotary, absolutely impossible a slot or recess is made in the axle, a key-plate being made to fit into it, so that it is held between the lug and the arm of the wheel, the bolt used to contract the boss being also used to secure the key-plate by passing through a suitable hole at its upper end. The wheels have not any trouble in being detached in cases of injury to an axle, and the parts can be fitted together with the greatest ease, everything being of the simplest character. To coalowners in particular the corf wheels and axles of steel, patented by the Jessops' Company, cannot fail to be well appreciated as providing an admitted improvement in connection with underground haulage.

DEEP WINNING OF COAL IN SOUTH WALES.

The deepest winning in the South Wales district has been made in connection with Harris's Navigation Pits, and a valuable and interesting paper on the subject has been read before the Institution of Civil Engineers by Messrs. T. F. Brown, and G. F. Adams, Members I.C.E. The depth of the lowest seam at present sunk to was 760 yards; the pits were each 17 ft. in diameter inside the walling. In addition to the depth, a special feature was the thickness of hard and heavily-watered rock penetrated. Guide ropes, upon the Gallo-way principle, were used in sinking, and the value of this system was shown in the saving of over two minutes in steadying the bowk at the bottom of the pit at depths of 475 and 530 yards, the total time occupied in clearance at the latter depth being three minutes twenty-six seconds.

The method of dealing with the various feeders of water during sinking was described; one of the pits was drained by a hole bored by the diamond machine, which was put down, at a depth of 175 yards from the surface, for a further depth of 860 ft. When the strata were conformable, and cut up by faults which intersected all the measures, considerable objection existed to metal tubing, even for comparatively shallow depths; for the water could rarely be prevented from forcing its way through fissures into the underlying strata. Moreover, provision had to be made for the probable working of the Brithdir seam, a very watery measure, lying at a depth of 250 yards. On account of these and other circumstances it was ultimately decided to provide for the permanent pumping of all the feeders, and a powerful 100-in. Cornish pumping-engine was erected. The parallel motion for the main pump-rods was obtained by a gudgeon, attached to the top of rods carrying two slide blocks, which worked in cast-iron guides 13 ft. long, and 27 in. wide. This gudgeon was attached to the beam by two hammered iron radius-rods 43 ft. long, 10 in. wide, and tapering from 3 in. thick at the top and bottom to 1½ in. at the middle. The space between the rods was filled with pitch pine, 12 in. thick at the top and bottom, and 18 inches wide in the middle. Five lifts, three of which were 26 in. in diameter, and the others 22 in. and 21½ in., were worked by the Cornish engine. The total feeders amounted to 440 gallons, of which 298 were pumped from a depth of 467 yards. The rods were double, of pitch pine, 16 in. square. To economise space in the pit, the lifts were fixed in one perpendicular line; to effect this the rods directly above the plunger and the rods below were connected by side-rods and distance pieces; the horizontal connecting pipe of the H piece being cast semi-circular to allow the rods to pass down in a straight line. The total weight of rods, &c., amounted to 181½ tons, that of the water being 133 tons; 35 tons of the difference were counter-balanced by a balance beam in the pit, leaving 13½ tons to overcome friction.

A large diamond boring-machine was used for a portion of the sinking. The apparatus weighed 10 tons, and consisted of four beams, or transoms, fixed to a centre piece; on the transoms were placed the drills (ten in number), which could be moved to any part of, or inclined to any angle parallel with, the face of the transoms, and each drill could be started or stopped singly. In making the first trial 30 to 40 short holes, at varying angles, and from 3 to 5 ft. in depth, were bored, the operations requiring 12 to 14 hours. Nearly one-half of this time was occupied in jacking the machine for the various positions required to bore the sumping holes, bench holes to sump, and, finally, the cropping holes. Long holes from 15 to 30 ft. in depth were subsequently tried, and blasted in sections; but having to be bored vertically, so as not to pass out of the line of the shaft, they had not always the most effectual lifting power. Better progress was made with single drills, but the cost of diamonds became too great for the frequent holes and changes, and the contracting company completed their contract by means of a percussive drill, designed by Col. Beaumont. Ingersoll drills were afterwards used; these had a diameter of 3½ in., and a stroke of 4½ in., and gave excellent results; the only difficulty experienced being in the wear and tear of the tappets, which, when they broke, generally caused damage in the cylinder.

In hard and wet rock dynamite was found to be a much more effective explosive than gunpowder, requiring about half the number of holes, and saving tamping. In shale, without water, powder was more effective, dynamite being more rapid in its action. In sinking through 3 yards of dry Pennant rock the cost of powder and dynamite were, respectively, 12s. 1s. 3d., and 10s. 1s. 8d.

Under the circumstances which attended this sinking in hard and wet rocks, 3 yards were considered good progress by hand, and 4½ by machine per week; but the authors were of opinion that this rate ought to be improved upon with further experience; they had also arrived at the conclusion that the cost of sinking by machine was less than by hand labour. The average rate of sinking, including walling, but exclusive of stoppages, was 3.77 yards per week, there being nearly an equal percentage of hard rock and shale; the actual sinking occupied about one-half the total time, and walling 12 per cent. The south pit, which was the deeper of the two, was commenced in February, 1873, and finished in February, 1879. The average cost per yard of sinking in shale by hand and without pumps, near the bottom of the shaft, was 11s. 19s. 6s. 4d.; with pumps, 13s. 2s. 8s. 4d.; in hard Pennant rock by hand without pumps it was 40s. 8s. 5s. 4d.; with pumps, 44s. 13s. 2s. 9d. In Pennant rock with pumps and three drills the cost was 34s. 3s. The cost of the 18-inch walling without pumps, including the proportion of iron curbs, came to 11s. 7s. 10d. per yard in depth, or 1s. 3s. 10d. per cubic yard; with pumps, to 1s. 7s. 5d. per cubic yard. These averages included all labour, stores, coal, &c., the items of which were given in a tabulated form.

The authors alluded to a furnace as being, probably, the most effective means of ventilation at such a depth; but leaving this question for future consideration, they had meantime erected a Schiele fan 14 ft. 3 in. in diameter, and capable of producing a current of about 250,000 cubic feet per minute; this had been done after a series of experiments in various districts. The authors stated their objections to the positive type ventilators—that in the event of obstructions occurring in the air ways, undue pressure might be applied to separation doors, air crossings &c.—besides which they caused a vibratory motion, were costly to erect, and the working parts, in some cases, were liable to get out of repair. Of the closed fans, which, it was stated, gave slightly better results than open fans, the Guibal and Schiele were the best.

The winding-engine, was designed to raise 2000 tons of coal in ten hours of constant drawing; the weight, exclusive of the rope, being 10½ tons, and the velocity of the ascending cage 40 to 45 ft. per second. The scroll drum, with a small diameter of 18 ft., rising by fourteen coils to 32 ft., was considered the best method of counterbalancing the rope. The cylinders were 54 in. in diameter with 7-ft. stroke; they were inverted and placed on cast-iron supports, the drum being fixed below on masonry pillars. The valves were double bent, and, for the steam-valves, Barclay's simple trip expansion gear was used. The rope was a parallel flat rope of the best selected steel, and consisted of 114 No. 11 gauge wires. The calculated breaking strain

was 104 tons, and the factor of safety was 9. The pit frame, which was entirely of wrought iron, sheaves, cages, trams, and guides in the pit were fully described; also, a scheme for loading and unloading a single-decked cage, by gravitation of tubs; the empty trains were hoisted about 6 ft., and made to run down an inclined way to the cage, being stopped and relieved by a system of catches. The cage was so arranged that on landing on the steps the bottom was inclined. The shaft pillar was 400 yards square, and the laying out of roads and method of working trams about the pit bottom were fully explained.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. S. J. DAVEY, mine shareholder, Redruth (March 24), writes:—Carn Brea, East Pool, West Pevor, and Wheal Agar shares have advanced in our market since last week, without being largely dealt in. Pedn-an-drea shares advanced to 4½, 4½, from 3½, 3½. A very large business has been done in these shares. To-day they declined to 3½, 3½. Other shares are also without animation. The following are the closing prices:—Blue Hills, 3½ to 3½; Carn Brea, 135 to 137; Cook's Kitchen, 11½ to 12½; Dolcoath, 56½ to 56½; East Pool, 35 to 35½; Killfret, ¼ to ¼; Mellanear, 5 to 5½; New Cook's Kitchen, 6 to 6½; North Busy, ¼ to ¼; Penhalg, 1½ to 1½; Pedn-an-drea, 3½ to 3½; South Condurrow, 9½ to 10; South Crofty, 9½ to 9½; South Frances, 9½ to 9½; Tincroft, 18½ to 19½; West Basset, 15½ to 16; West Frances, 11 to 11½; West Kitt, 3 to 3½; West Pevor, 16½ to 17½; West Pollice, 4 to 4½; West Seton, 21 to 23; West Tolgus, 30 to 35; Wheal Agar, 8½ to 9½; Wheal Basset, 4 to 4½; Wheal Comford, 4 to 4½; Wheal Grenville, 9 to 9½; Wheal Pevor, 19 to 20; Wheal Prussia, 1½ to 1½; Wheal Boys, 2½ to 2½; Wheal Uny, 3 to 3½.

—Mr. J. H. REYNOLDS, stock and share broker, Redruth (March 24), writes:—A good business has been done in Carn Brea, East Pool, Pednandrea, and Wheal Agar shares, at an advance; but the latter do not close quite so firm. West Seton and West Frances shares also in demand. Following are closing quotations:—Blue Hills, 3½ to 3½; Carn Brea, 134 to 136; Cook's Kitchen, 11½ to 11½; Dolcoath, 56½ to 56½; East Pool, 35½ to 35½; Gunnislake (Clitters), 4½ to 5; Mant, 6 to 6½; Marke Valley, 1½ to 1½; Mellanear, 5 to 5½; New Cook's Kitchen, 6 to 6½; North Busy, 17½ to 17½; North Herodsfoot, 10½ to 12½; North Penstruthal, 1½ to 1½; Pedn-an-drea, 3½ to 4; Phenix, 2½ to 3; Penhalg, 1½ to 2; South Caradon, 6 to 6½; South Condurrow, 9½ to 10; South Crofty, 9½ to 10; South Frances, 9½ to 9½; Tincroft, 18½ to 19½; Trugo, 1½ to 1½; West Basset, 16 to 16½; West Frances, 11 to 11½; West Pevor, 16½ to 16½; West Pollice, 4 to 4½; West Seton, 21 to 23; West Tolgus, 30 to 35; Wheal Agar, 9 to 9½; Wheal Basset, 4½ to 4½; Wheal Boys, 2½ to 2½; Wheal Comford, 4½ to 4½; Wheal Grenville, 9 to 9½; Wheal Jan, 10½ to 15½; Wheal Pevor, 19 to 20; Wheal Kitty, 2 to 2½; Wheal Prussia, 1½ to 1½; Wheal Uny, 3 to 3½. Cornish Bank, 21.

—Mr. JOHN CARTER, mine shareholder, Camborne (March 24), writes:—The principal change to notice in the share market is the very rapid rise in Pedn-an-drea shares to 4½, buyers, and equally sudden fall to 3½, sellers, to-day—the rise being considered a purely market operation. Wheal Agar shares have further improved during the week, but do not close at best. Carn Brea shares have also advanced, but to-day there is little demand for them. South Frances shares have been in favour, and transactions are reported at 9½. West Basset shares are weaker, at 16 sellers. West Pevor shares have improved, without much business being done. Annexed are closing quotations:—Blue Hills, 3½ to 3½; Carn Brea, 134 to 136; Cook's Kitchen, 11½ to 12; Dolcoath, 56½ to 57; East Pool, 35 to 35½; Gunnislake, 4½ to 5; Mant, 6 to 6½; Marke Valley, 1½ to 1½; Mellanear, 5 to 5½; New Cook's Kitchen, 6 to 6½; North Busy, 17½ to 17½; North Herodsfoot, 10½ to 12½; North Penstruthal, 1½ to 1½; Pedn-an-drea, 3½ to 4; Phenix, 2½ to 3; Penhalg, 1½ to 2; South Caradon, 6 to 6½; South Condurrow, 9½ to 10; South Crofty, 9½ to 9½; South Frances, 9½ to 9½; Tincroft, 18½ to 19½; Trugo, 1½ to 1½; West Basset, 16 to 16½; West Frances, 11 to 11½; West Pevor, 16½ to 16½; West Pollice, 4 to 4½; West Seton, 21 to 23; West Tolgus, 30 to 35; Wheal Agar, 9 to 9½; Wheal Basset, 4½ to 4½; Wheal Grenville, 9 to 9½; Wheal Jan, 10½ to 15½; Wheal Pevor, 19 to 20; Wheal Kitty, 2 to 2½; Wheal Prussia, 1½ to 1½; Wheal Uny, 3 to 3½; North Busy, 20½ to 25½.

—Mr. M. W. BAWDEN, Liskeard (March 24), writes:—The mining market has been moderately active throughout the week for good progressive stock, and most of the shares at a price. Bedford United, Bedford United, Carn Brea, Phenix United, South Caradon, South Frances, and Wheal Agar shares chiefly in demand. Closing prices:—Bedford United, 2½ to 2½; Carn Brea, 134 to 136; Gunnislake (Clitters), 4½ to 4½; Cook's Kitchen, 11½ to 12; Dolcoath, 57 to 57½; Drake Wells, 13½ to 14; Devon Consols, 11½ to 12; Devon Great United, 13½ to 14; East Caradon, 1½ to 1½; East Crebor, ¼ to ¼; East Herodsfoot, 1 to 1½; East Pool, 35 to 35½; Gawton United, 1½ to 1½; Glasgow Caradon, 1 to 1½; Herodsfoot, ¾ to 1; Hingston Down, 1½ to 1½; Kit Hill Consols, 1½ to 1½; Lady Bertha, ¾ to ¾; Marke Valley, 1½ to 1½; New West Caradon, ¾ to ¾; North Herodsfoot, ¾ to ¾; Old Gunnislake, ¾ to ¾; Phenix United, 3½ to 3½; Prince of Wales, ¾ to ¾; South Caradon, 6½ to 6½; South Condurrow, 9½ to 10; South Crebor, 1 to 1½; South Crofty, 9½ to 10; South Devon United, 3½ to 3½; South Frances, 9½ to 10; Tincroft, 18½ to 19; West Basset, 16 to 16½; West Caradon, ¾ to 1; West Crebor, ¾ to ¾; West Frances, 11 to 11½; West Phenix, 1½ to 1½; West Pevor, 16 to 16½; West Tolgus, 30 to 31; Wheal Agar, 9½ to 9½; Wheal Basset, 4½ to 4½; Wheal Crebor, 4 to 4½; Wheal Grenville, 9 to 9½; Wheal Hony and Trevelyan, 2½ to 2½; Wheal Kitty, 2 to 2½; Wheal Jan, 9½ to 9½; Wheal Pevor, 19½ to 20; Wheal Uny, 3½ to 3½.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, sharebrokers, Queen's Chambers, Market-street (March 24), write:—Although a recovery is to be noticed in some of the leading stocks in which speculative operations are mostly carried on there is very little strength even in this market, and amongst most other classes of securities dulness still rules. Though a few instances are to be noted where enhanced values are marked, there are none which are of sufficient moment to mark a decided tendency, whilst, on the other hand, there are some cases of decline which are severe and noteworthy. The amount of business reported for the week is again small, very little disposition to operate being manifested, the capital seeking employment being apparently withheld for more favourable figures, which sellers who can afford to wait are averse to concede to.

BANKS.—Excepting in Union Bank of Manchester, dealings in which have been reported a few times, business has been of a desultory character; prices realised, however, have been about or very near rates current a week ago. The changes of quotations are irregular, and there are none of great moment. National Provincial ordinary are ½ higher; the new shares of this company have been marked higher during the week, but to-day again quote same as last week. Consolidated Bank quote ¼ higher also, whilst Bank of Liverpool are ¼, and Manchester and County, Manchester and Liverpool District, and Union Bank of Manchester are each ¼ lower.

INSURANCE.—Though by no means brisk a fair proportion of the week's business has been in insurance shares at figures generally up to late rates. The variations of prices are irregular. Advances are to be noticed in British and Foreign Marine of ½, and of ½ in Thames and Mersey Marine, Queen's ¼, Liverpool and London and Globe ¼ Commercial Union ¼, and British Re-Insurance ¼. The last named held its first general meeting to-day, at which the report presented may be considered encouraging, the company having had no losses up to present, doing a satisfactory business, and only accepting risks of a safe character. English and Lancashire, which have been fairly maintained, have been depressed, having lately attracted attention, and have to-day changed hands at par. The adverse changes are:—Boiler Insurance and Steam-Power ¼, Sea ½, National Boiler ¼, Lancashire and Yorkshire ¼, and London and Staffordshire Fire ¼.

COAL, IRON, & MINING.—It is some time since so few transactions for a week have been recorded in this market, for with the exception of a solitary transaction each on Chatterley Iron and John Browns, and one or two markings in Indian Gold mines, the only concerns touched have been Bolewoks fully paid, and Ebbw Vale. In Bolewoks figures on dealings have been fairly maintained, but in Ebbw Vale prices have declined rapidly. The quotations show changes for the worse in great majority, the only instances of advance being ¼ on Sheepbridge, ¼ on United States Rolling Stock, and ¼ on Tharsis Sulphur, &c., the last named having receded from last week's figures, but subsequently rallied, and to-day quote the advance stated. The following are quoted lower:—Consent Iron, 2½; Telegraph Construction and Maintenance, 2½; Bilbaw Iron Ore, 2; Ebbw Vale, 1½; Llynvi and Tondy, 1½; Tredegar, A, 1; West Cumberland, 1; John Browns, 1; A. Knowles and Sons, ½; Darlington Iron, ¾; Bolewoks, fully paid, 1; Bolewoks, ½; and Bolewoks, ½.

COTTON SPINNING AND MANUFACTURING.—The market continues dull, and in some cases consequent on trade advices being still unsatisfactory lower figures are marked. A solitary transaction on Bridgewater preference, which are also marked ¼ higher, comprise the movements in this class. **TELEGRAPHS.**—A very decided upward movement has developed in Anglo descriptions, the ordinary being 3½, and the deferred and preferred 3 each higher. Others are only fractionally changed, all changes being for the better, except Globe, which are ½ down. In CORPORATION STOCK, &c., Bradford Stock is 1 higher, and Manchester Stock ½ lower, very few dealings being noted.

MISCELLANEOUS.—Barlow and Jones and Southport Victoria Hotels are ¼ each better, whilst Manchester Carriage, B, are ½, ditto, C, ½, and London and Manchester Plate-Glass ¼ lower.

RAILWAYS.—There has been a recovery in most stocks during the week, but no strength of moment is given, since traffics tend to dishearten supporters for higher prices. Brighton, A, have led the way in fluctuating, having been up to 132½, receding again to 131, closing this evening only slightly above the latter figure. A feature to-day has been the heavy sale of British Railway stock, the publication in the Daily News of the amount debited to capital for the Tay Bridge construction; balance left after meeting claims, &c., arising from the accident and the sum necessary to build the new bridge. The movements in others are not practically striking, the only exception being Metropolitan District, which have fallen 2½. Alterations in Canadian results in a reduction in values of Grand Trunk Preference, mostly noticeable in Seconds and Thirds. Great Westerns, however, are rather better. The American market has shown very little strength, and prices all quote lower.

HULL.—Mr. W. FOWLER SUTTON, stock and share broker, St. Mary's Chambers (March 24), writes:—Dulness and stagnation have prevailed this week in the shares and stock exchanges of the country, and prices almost without exception seem on the decline, despite cheap money and somewhat better weather. Possibly the late opening of the Baltic ports may have something to do with the poor returns of some of the lines, but the fact cannot be blinked that trade is not in that prosperous condition which it was anticipated it would be some little time ago, though there appears every reason to believe that the stock markets are in such a position as that they would quickly reflect any improvement in the trade of the country. Several stocks are beginning to look very cheap, but can only be considered so after all if last year's dividends are maintained, and not if we are going to have decreased traffics with increased preference charges, and possibly working expenses also. Canada shares keep firm, and the general opinion re-

specting them is in favour of their seeing higher prices. Trunk stocks, on the other hand, are a bad market for some occult reason, and there are many who prophecy they have seen their best for a long time to come. If so, however, either the stocks are in weak hands or Canadian prosperity must be of a very evanescent character. The firmest American stock for the moment is Oregon, which may possibly have a rise before long. In foreign stocks Egyptian and Turkish are also strong, the general belief being that Turkey and Greece will not fight, and that as soon as the matters between them are arranged we may look for a serious attempt at financial regeneration by the former country—a consummation devoutly to be wished. Local stocks show little change, but there is a better feeling and more enquiries for Hull and Barnsley shares, which are likely to improve shortly. Hull Banks, 12½; Yorkshire Banks, 25½; London and Yorkshire Banks, 32s. 6d.; Earle's Shipbuilding, 20½; Hull Trams, 9½; British Gas, 34; Hull Gas, 56; Hull Docks, 87½.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, sharebroker and ironbroker (March 24), writes:—During the past week markets have all been extremely dull, owing to the unfavourable weather, but trade generally appears to be in as satisfactory a state as can be expected, and, considering the easy state of the money market, there is little doubt should the harvest prospects be good but that markets will again become active.

In shares of coal, iron, and steel companies the movements for the week are mostly downwards. Ebbw Vale have declined 2s. 6d. per share; Steel Company of Scotland, 8s. 9d.; Chillington Iron, 6s. 3d.; Glasgow Port Washington, 3s.; Bolewoks, Vaughan, also Onna and Cleland, each 2s. 6d.; Benhar, Clyde Coal, and Marbella each 1s. On the other hand, Monkland have risen by 1s. on Conference, and 5s. 6d. on ordinary shares, owing to the prospect of some arrangements being made to extricate the company from its financial difficulties. In the Scotch pig iron market the price of warrants has declined from 42s. 6d. to 47s. 7½d., and is now so low that a loss must in some cases be incurred upon the production, but as yet it is impossible to forecast whether a recovery will be brought about by furnaces being blown-out voluntarily or otherwise, or by increased demand. Apparently the home trade is increasing, but owing to the inclement weather there are no signs of the usual spring demand from abroad, so that stocks are still increasing. Should a rally in prices be effected the heavily over-sold state of the market will be an important element in assisting the rise. Benhar are at 9s. 6d. to 10s. 6d.; Bilbaw Iron, 29 to 29½; Bilson and Crump Meadow Colliery, 60s.; Bolewoks, Vaughan, 28½ to 29½; Cardiff and Swansea Colliery, 40s. to 45s.; Chapel House Colliery, 10s. to 20s.; Chillington Iron, 62s. 6d. to 67s. 6d.; Clyde Coal, 81s. to 83s.; Ebbw Vale, 8½ to 9½; Henry Briggs, A, 10 to 12; John Bagnall and Sons, 5s. to 15s.; Lochore and Capelrae (pref.), 11; Lofthouse Colliery, 72s.; Llynvi and Tondy, 10½; Marbella's Iron, 80s. to 83s.; Monkland Iron and Coal, 36s. to 38s.; ditto (pref.), 68s. to 70s. (after touching 42s.); Oakham Colliery (pref.), 5s.; Onna and Cleland, 25s. to 28s.; Steel Company of Scotland, 10½ to 10¾; and Thorp's Gawber Hall, 20s.

In shares of foreign copper concerns the tendency of prices has been favourable. Rio Tinto have advanced 1½, Tharsis, 18s. 9d.; Panulicillo, 1s. 3d.; but Tharsis (new) are reduced 1½ per share; Huntingdon, 1s. 6d.; and Canadian, 4d. The principal business has been in Tharsis, which advanced from 39½ to 41, and maintain the most of this rise. Canadian are at 43s. to 45s.; Huntingdon, 54s. 6d.; Panulicillo, 6½ to 6½. Rio Tinto advanced from 22½ to 24½.

In shares of home mines business continues dull. Tin shares are very firm, in sympathy with the market for that metal. Glasgow Caradon have declined from 20s. to 18s. The meeting of West Kittie Mine is to be on March 31. Bedford United are at 42s. 6d.; Blaen Caelan, 21s. 3d.; Carn Brea, 135; Cambrian, 12s. 6d.; Cwm Pryf, 7s. 6d.; Devon United, 47s. 6d.; Denbighshire Consols, 60s.; East Buller, 12s. 6d.; East Chiverton, 30s. to 40s.; East Longlake, 30s.; East Roman Gravel, 12s. 6d. to 17s. 6d.; Gorsefield and Merlyn, 60s.; Great Holway, 5½; Gawton, 22s. 6d. to 27s. 6d.; Indian Queens, 40s. to 50s.; Llanrwst, 2s. 6d.; New Kittie, 25s. to 35s.; New Wye Valley, 25s.; North D'Esrey, 20s. to 25s.; North Hendre, 5s.; North Penstruthal, 27s. 6d. to 32s. 6d.; Parka Colliery, 40s. to 50s.; Penry-Ore, 20s. to 25s.; Roman Gravel, 11½; Just United, 52s. 6d.; South Crebor, 21s.; South D'Esrey, 13s. 9d.; South Tolcarre, 25s.; Tamar, 15s. to 25s.; Tinnill, 35s. to 40s.; West Crebor, 8s. to 10s.; West Holway, 33s.; West Kittie, 57s. 6d. to 62s. 6d.; West Phenix, 37s. 6d. to 42s. 6d.; Wheal Agar, 9½; Wheal Crebor, 85s.; Wheal George, 35s. to 40s.; Wheal Irwell, 15s. to 20s.; Wheal Fortune, 40s.; and Wheal Owles, 5½ to 6½.

In shares of gold and silver mines there is no particular alteration to notice, but prices remain steady. Flavius's wanted. Californian Gold Mine are at 5s. to 10s. prem.; Chontales, 2s. 6d. to 3s. 9d.; Callio, 2s. 6d. to 3s. 9d.; English-Australian, 23s. 9d.; Gold Mining Association of Canada, 20s.; Gold Coast, 5s. to 8s.; Great Southern Mysore, 10s.; Indian Trevelyan, 2s. 6d. to 3s. 9d. prem.; Indian Mammoth, 5s. dis. to par; Mysore Reef, 2s. 6d. prem.; Nava De Jadraque, 10s. to 12s. 6d.; New Gold Run, 5s.; Pestareia United, 5s. to 10s.; Silver Peak, 25s.; South Indian, 50s. to 55s.; and Victoria (London), 8s.

In shares of oil companies Broxburn have declined 15s. per share: Young's Paraffin, 5s., and Oakbank, 2s. Business has been done in Young's from 11½ to 11¾. Business in miscellaneous securities is extremely restricted. Lawes' Chemical unaltered at 5½ to 5¾.

IRON AND COAL COMPANY.—The meeting of the committee and directors of this company having been private nothing reliable can be reported as to it. It is understood, it was ascertained that the loans and debentures outstanding amount to 85,852½, the greatest portion of which are held by the directors and their friends, and the payment of the remainder is not being pressed for. The assets are put down at 397,000½, and the claims 169,587½, a respectable surplus being thus shown. In the first half of last year a profit of 17,000½ was made, and they only lost through the strike. The proposal to extricate the concern from its difficulties is to form a new company—The Monkland Iron and Coal Loan Company (Limited)—with a capital of 150,000½, in 5s. shares. These 5s. shares are only to be 1½ paid-up, and on the guarantee of the remaining 4½ uncalled money is to be borrowed, and the whole loaned to the working company. The new company will take as security the stock and assets of the working company till the loans are repaid, and meanwhile would derive as dividend the difference between the interest received from the working company for the loan of the money and the interest they borrow it at.

IRISH MINING AND MISCELLANEOUS COMPANIES' SHARE MARKET.

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (March 23), write:—Markets remain dull, and business limited. Great Southern have been dealt in at 114 to 114½, and Midlands at 85½ to 86. Bandon are rather sellers at 86½, and Macrooms at 6½. Macroom Five Per Cent. Preference are also offered at 6½. National Banks are easier, at 68½ to 69½, and Munsters at 63½ to 67½. No change in Provincials. Hibernians, 43 to 43½. Cork Steam Packets are dull, at 12½, and Lyons shares at 4½ to 5. Dalys are offered at 2½, and Gas shares at 7½. Gouldings remain 9½ to 9¾, and Levys 4 to 4½. Harbour Board Debentures are 102½ to 102¾.

THE PERRAN SILVER-LEAD CONSOLS (PERRANZABULOE).

March 17.—I herewith beg to hand you my report on this mine, and details of work done since we commenced working:—

Underground Department: The deep adit level has been cleared and secured with timber from the mouth on the beach to Hall's engine-shaft, a distance of 110 fathoms; we have had great difficulty with this, in consequence of the extensive heavy runs of ground which had taken place in the backs of this level for upwards of 50 fathoms in length, which have required a large quantity of timber, together with the 16-in. launders, &c., so as to carry the water, and to prevent the same from again interfering with the deeper workings of the mine. The engine-shaft has been collared up, ladder-rod fixed from the surface to the adit level, a depth of 35 fathoms, cistern placed to receive the cistern and bearers, and the shaft is now ready to receive the required pit-rod, &c., to that level, preparatory to going below as soon as the engine commences to work. Morcom's flat-roof shaft has been cleared and secured, ladder-rod fixed from surface to the adit level 30 fathoms, and the shaft is in good repair to that depth.—Surface: The cylinder loading has been taken out of the engine-house and rebuilt, so as to receive the 60-inch cylinder engine, ground removed for balance-bob, and the required masonry is complete, together with stands for shears, the boiler-houses are cleaned out, and bottom flues built ready to receive the boilers, also the lobby from under the cistern, so as to enable us to clean the fame when required, and for other purposes; we have also made a large reservoir to retain all rain water from the river, and this will effect a great saving in time and money.

Carpentry: The carpenters have most of the heavy timber work prepared for the engine-house, such as spring beams, girders, with the necessary beams for the first and second floors, catrick cisterns, &c., &c. The 60 ft. shears is nearly complete for lifting; they have also been employed in making benches, saw-pit frame bars, repairing the different houses, 70 fms. ladders for halls and Morcom's shaft, with other requirements.—Masonry: The masons have built the before-mentioned loadings for the 60-in. cylinder engine, bob-pit, stands for shears, together with two smith's hearths with stacks, removed wall under the plug-door, and rebuilt the same, also lobby from under the cistern, and bottom flues for boilers, repaired roofs of account house, smith shop material, and other houses. In this department we are in a forward state.—Smith's Work: The smiths have been busily engaged in getting the required ironwork on for the engineer and other requirements, such as ironwork for shears, &c., making tools, bolts for underground purposes, &c., &c.—Engineering: The 60-in. cylinder pumping-engine is nearly all delivered on the mine, and the masts, with wall plate and stools, are in their places with spring beams and girder. At this time the engineer is engaged in fixing the cylinder bed stones, after which the cylinder will be fixed in a day or two, when we shall rapidly get on with fixing the other parts of the engine, &c., &c.—Boiler Men: These men have completed the repairs of No. 1 boiler with new plates in the case, which took them 11 days, and at present are engaged on No. 2 boiler. This will require more extensive repairs in the bottom part of the case in consequence of its having been embedded in water for some time, which was quite unknown, but the tube is in

good condition, which we found on its being withdrawn from the case. This work will be done quite in time and as fast as possible.

Staff: We have at present employed three smiths, two carpenters, two masons with four labourers, one engineer with six labourers, two men screwing, two men with carpenters, two men and one boy sawing, and three men underground; total, 27 men and one boy. There are also four men engaged in taking abroad the balance-bobs, flat-rods, and loading the remaining part of the 60-in. cylinder engine, boiler, &c., all of which have proved far above our expectation, and was a great bargain, but it must be borne in mind that the fearful weather that we have had to contend with has very considerably retarded our progress. Such a winter has not been experienced for a great number of years, rendering it impossible to get the heavy parts of the engine which was wanted first on the mine. I am pleased to say the weather is now very favourable, and we are making great progress, and if we can succeed in getting the required pitwork, &c., second-hand at once, we see no reason in getting the pumping-engine to work in the course of five or six weeks' time. And all being well, and the plunger lifts hold good which are now under water, why the water should not be drained to the bottom, 110 fms. level in about two months; and as soon as the levels are cleared we can send to surface fully 50 tons of silver-lead ore per month, as stated in my report. No time will be lost on my part to accomplish this.

RICHARD PRYOR.

Meetings of Public Companies.

MONA MINES.

The ordinary general meeting of shareholders was held at the offices, Austinfrans, on Tuesday.

Mr. WILLIAM B. DICK in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting. The report and accounts were taken as read.

The CHAIRMAN said he had the assurance of Mr. Evans, the managing director, and Capt. Hughes, the underground manager, that the report occupied them for several days, and that there was nothing stated in it but positive facts; in fact, their statement with regard to the prosperity of the mine was rather under than over stated. When this company took over the mine the product of the property was at the very low ebb of something like 70 tons of copper ore per month; but during the last six months the company had been working assiduously to erect the necessary machinery to bring the mine into full operation. That plant had been at work now for several weeks, and he was glad to say that the old mines had been sunk down to the proper levels, where they had arranged to go to at first. Their success there had been very great. The mines had been unwatered, and the product last month amounted to very nearly 400 tons, and he was assured that there would be no difficulty in maintaining the output during the current year. One thing which had militated against them to a certain extent during the past six months had been in connection with the bluestone. The price of zinc had fallen from 21½ per ton to about 15½, and no sales of bluestone ore had been made since May. One very pleasing feature to which he had to call attention was the discovery made by Mr. Evans in another part of the mine altogether. In his report he said:—"It is a pleasure to me to report that a recent examination of the surface far to the east of any work done in modern times has proved the existence at that point of a huge mass of gossan, which contains such a high percentage of iron that the Mostyn, Corn and Iron Company, after making an analysis, have taken two cargoes on trial. The quantity must be enormous judging from its thickness and apparent extent. If it turns out of economic value as an ore of iron, it cannot fail to be a source of profit; but its value in this respect is of far smaller importance than the indications it furnishes of a great deposit of ore identical in character and extent with those of the great opencast. This gossan is precisely the same as that which covered them, and seeing that it lies in a direct line with them and is flanked to the north by the same hard felspathic rock, one may conclude almost with certainty that it is simply a continuation tending eastward." It was the opinion of Mr. Evans and Captain Hughes that this gossan would prove a source of revenue to the company. The gossan was almost unlimited in extent, and could be raised and shipped at a cost of about 4s. 6d. or 5s. per ton, and he believed it could be sold at from 10s. to 12s. 6d. per ton. That of itself, apart from the revenue from the other parts of the mine, would prove a very great value to the company. Both Mr. Evans and Capt. Hughes were present, and would be happy to afford any additional information. The Chairman then moved the adoption of the report and accounts.—Mr. GEORGE BATTERS seconded the motion, which was carried unanimously.

Mr. CARL thought that the amount of income-tax—100%—payable on the dividend of 4000½, should be put in the accounts.

Mr. EVANS added that the company pays income-tax on the profits of the mine and the royalties at the same time, deducting afterwards from the lords their proportion of it for the royalties afterwards paid.

The SECRETARY said the income-tax was not paid on the dividends paid to the shareholders, but on the profits as shown in the balance-sheet.

Mr. D. THOMAS said at the meeting in May the Chairman stated that the ore sold in four months was of the value of 10,000½, and that this was raised at a cost of 2300½, leaving a net profit of over 7000½; but in the estimate for the coming year it was only anticipated that 10,000½ profit would be made.

The CHAIRMAN, in reply, said that before the last meeting they had sold a very large accumulation of bluestone—zinc at the time realising 21½ per ton—but the price fell suddenly, and there had not been a sale of this ore since last May. Had the price of zinc continued to be good they would have gone on selling, and if it improved the sales would be resumed; but the estimate was quite irrespective of any sales of bluestone, and was upon the product of those parts of the property which were lying dormant at the date of the last meeting. Since then a pumping engine had been erected and worked, and they had realised all they expected, and perhaps a little more.

Mr. THOMAS did not think the item of 5400½ for stocks of produce prepared for sale Dec. 31, 1880, should appear in the balance-sheet.

Mr. G. BATTERS said the hon. proprietor overlooked the fact that when the mines were taken 4000½ was paid for plant, and 4000½ for the value of the stocks, and instead of the stocks having decreased in value, the marketable products had increased very considerably; and there was no doubt that they had a very much larger amount of available saleable product at the present moment than of the value of 5000½. He thought it was a very proper asset to bring in against the charges on the other side of the accounts. For instance, the returns of copper in course of smelting were of considerable value, the dry ochres ready for sale were of value, as was bluestone, all bought and paid for, and ready to be thrown into the precipitate pits. These were as good assets as the cash at the bank. The old iron had been put down at 2½ per ton, but it was doubtless of greater value. He agreed that it would not be right to carry the stock in trade into the balance-sheet, but they merely valued the goods, as it were, in their warehouse. No doubt the hon. proprietor, with others, had a perfect right to ask questions, for when the property was taken over they were all excited with its vast value, and faith in its future. Spelter at that time was selling at a high price, but, unhappily, it had a sudden drop; and since May no sales of bluestone had taken place. This had made a great difference—a great difference—in their profits. During the past year the company had made and declared a 10 per cent. dividend. They took over the old mines requiring a deal of money laying out on them to bring them into good working order; but during the period which had since elapsed they had raised the sales of copper from 70 to 350 tons a month. Mr. Evans assured him of the probability of the return being continued, and if that estimate were realised it meant a 30s. dividend for the year. This estimate was based on what was being done now, and not from any drawing on the imagination as to the future.

The Chairman, in reply, said that the hon. proprietor had neglected the putting of an engine and an outlay on capital of some 10,000½, or 15,000½, and it was a very good job to spend the capital on works of this kind, for the quicker they did such work the greater the economy in the future operations. The result of the unwatering of this shaft was that they had laid open a system of workings which when they were abandoned some years ago—owing to the influx of water—were returning 350 tons a month. If Mr. Evans could return anything like that from Cairn shaft, and without the large returns from the Sydney shaft—where at the 70 they had a course of ore of good produce extending a great length, and proved at least 30 fms. further east of them—they could have very fine results from that part of the mine, and thereby no reason why the return from Cairn shaft should not be as good as when its working was abandoned some years ago, but it would require some little time to develop. The slush from the bottom of the mine and the debris which had accumulated since the water had been got out had not yet been cleared away, and they had not yet made any returns from that part of the mine. The new engine also drained the eastern ground where there were two or three important shafts; where working had not been carried to a greater depth than from 20 to 30 fms. From these shafts in days gone by copper ore had been raised giving a return of 6 or 7 per cent. ore, and Mr. Faynter would corroborate him in saying so. That Mr. Evans thought well of the mine there could be no doubt, for he held more than one-eighth of the shares, and he could have parted with his interest had he chosen to do so at a high price. He left his position as Senior Government Inspector of Metallic Mines to take the management of this company, at a less salary than he was getting from the Government; and now devoted his whole time to these mines, so great was his belief in their prospects. With regard to the eastern workings, Mr. Evans stated that he had come upon a large body of gossan continuing eastward from the great opencast workings, which returned many millions of pounds sterling in profits during the last century; and Mr. Evans stated that this great deposit of iron ore was apparently on the back of another opencast which had not yet been proved, but which would be hoped soon to be proved. They wanted copper ore, for Mona was a copper mine, though it contained some valuable by-products, such as bluestone, which he (Mr. Batters) had no doubt would give them a very good profit should zinc advance in price. Even now the bluestone could be sold at a profit, but it would be a pity to sacrifice it at such a low price as could now be obtained. The oxides of iron and the ochre beds were also by-products, but they were very good ones; and Mr. Evans expected before returning to the mines to sell 4000½, or 5000½, worth of the oxides. The board had unbounded confidence in Mr. Evans. (Hear, hear.) He (Mr. Batters) trusted that as the returns of copper ore had been increased to 400 tons this year, the next would be from 800 or 1000 tons, and he could see no reason why they should not do so. All the stuff could be turned into regulus by Mr. Evans in his own way, and it might, by and bye, be of sufficient importance for the copper to be turned into copper themselves, when they would be able to sell the copper at the highest price to be obtained in the country—as the Mona Copper had in days gone by. (Hear, hear.) They had also the north lode, which had not been worked on in the Mona sett, but which in the Parys' sett had given a profit of many hundreds of thousands of pounds. He was a believer in rock-drills, and hoped the north lode would be proved by means of one of them. He thoroughly believed in the future of the company, and that they would have 10 per cent. dividends, and a good deal better. (Cheers.)

Mr. PHILLIPS asked if it was intended to sink an engine-shaft at Cairn shaft?

from it, if you will allow me the expression. Everything that I have told you with regard to my anticipations have been realised. With regard to the mine it is a gigantic one, and it will in all probability last longer than any living man; I have never seen its equal." It is to be hoped that the new patent wire-rope tramway for conveying the ores from the mines to the dressing-floors, and the new and extensive additional dressing machinery, will be able to keep pace with the vast yield of ores from the workings now opened out.

FOREIGN MINING AND METALLURGY

The intelligence received with respect to the Belgian coal trade is, upon the whole, favourable, although some branches of this department of Belgian industry leave something to be desired. Exceptionally fine weather has somewhat reduced the demand for domestic qualities of coal, which are, of course, in less request with the approach of spring. In the Mons Basin there is little to complain of, deliveries being excessively active; notwithstanding bad weather and the almost constant flooding of the rivers for nearly three months past, stocks have not sensibly diminished, and in some cases they have not diminished. At Charleroi the situation is rather less favourable. Stocks are rather considerable, and deliveries have become less active. Quotations have experienced little change. With regard to the French coal trade, we learn that the Terfay and Ames Collieries (in the Pas de Calais) have just been sold for 49,800*l.* to M. Cailleau, a banker at Donai, acting on behalf of a company just formed, with a capital of 88,000*l.* The purchaser is further to pay 24,000*l.* for the plant and stores. Business has been very quiet in the German iron trade, and important contracts have been concluded with some difficulty. Prices have, however, not given way, as colliery proprietors have refused to make concessions.

The general aspect of the Belgian iron trade has been rather favourable, although prices have experienced no advance. The black spot in the situation is evidently excess of production. The administration of the Belgian State railways has just announced that it is about to dispose of 10,800 tons of old rails past service the same administration has given out orders for steel rails as follows: Selleson, 500 tons, at 6*l.* 6*s.* 6*d.* per ton; Angleur, 1800 tons, at 6*l.* 12*s.* per ton; and the John Cockerill Company, 5400 tons, at 6*l.* 12*s.* 2*d.* per ton. The company formed for working the Dutch State railways has just disposed of 5000 tons of old iron rails and other materials. The highest offer, 2*l.* 19*s.* 4*d.* per ton, was made by the house of Oving, of Rotterdam. The demand for bars and plates has declined in Germany, but the works are still pretty well occupied.

The aspect of the iron trade in the French department of the Haute-Marne continues fairly satisfactory. Merchants are pressing for the execution of existing contracts, and are also sending small orders for re-assortments. Casting pig No. 3 has made 3*l.* 12*s.* to 3*l.* 14*s.* per ton; rolled iron from coke-made pig has brought 7*l.* 12*s.* to 8*l.* per ton; and mixed ditto 8*l.* 8*s.* to 8*l.* 16*s.* per ton. Some of the industrialists of the Nord have advanced the price of iron 4*s.* per ton. This proceeding has immediately made its influence felt at Paris, where merchants' iron is quoted at 7*l.* 16*s.* per ton. Orders have come to hand of late in considerable numbers, and it is estimated that the amount of the new contracts concluded in the Nord during the last month or two is not less than 45,000 or 50,000 tons. In presence of this favourable state of affairs it has even been proposed to carry the price of iron to 7*l.* 8*s.* per ton at the works, which would be equivalent to 8*l.* to 8*l.* 4*s.* per ton at Paris. The French steelworks are extremely well employed.

As might have been expected, the parties to the convention between the Rhenish-Westphalian coalowners for the restriction of the output under penalties are beginning to find the arrangement somewhat inconvenient. It has been several times pointed out during the past 12 months that the current statistics did not show a reduction of the output in accordance with the agreement when the returns were compared with those for the corresponding portions of previous years. The difference in the conditions of production and demand prevented an equivalent reduction at all the pits, and in the case of certain pits the penalties were paid for the year 1879-80. It is now stated that the managers of a group of pits at Dortmund have been obliged to give notice of dismissal to 250 miners in order to avoid exceeding the conventional output. This proceeding is considered to be the more regrettable as the demand for the coals of the company in question has continued to expand month by month. During the last few months, however, the output has considerably exceeded the permissible quantity, and it will therefore be necessary to diminish the labour during the summer months. The irregular conditions of work which are thus being adopted in Westphalia, as well as in the Pennsylvania coalfields, may possibly bring home to the minds of the miners that the labourer as well as the consumer generally suffers by such artificial arrangements, which are almost necessary in protectionist countries.

SILVER STEEL—NEW INOXIDISABLE ALLOY.

In seeking for an inoxidisable alloy Mr. Peter de Villiers, M.D. of Silver Hill, St. Leonard's-on-Sea, has discovered that certain metals will not unite in certain proportions, and he has utilised this discovery to coat steel so perfectly that even the cutting edge of a knife blade is not blunted, or, rather, that the silvery surface remains uninjured when the knife is sharpened. In the first place, he makes an alloy of tin, 80; lead, 18; silver, 2 = 100 parts; or of tin, 90; lead, 9; silver, 1 = 100 parts. The tin is first melted, and when a brilliant whiteness of the surface of the metal indicates its thorough fusion the lead is added in a granular state, and the mixture is gradually stirred, preferably with a rod of very dry firwood. The silver separately melted is then added to and mixed in like manner with the compound. At this moment the fire under the melting pot or crucible containing the alloy must be quickly increased, till the surface of the metal has a slightly yellow tinge. It is then rapidly stirred, and run into moulds to form ingots. When he has the choice between iron and steel for the manufacture of any article to be coated he takes the purest steel used for manufacturing purposes. The blade of a knife, for example, is immersed in a bath of a solution of muriatic or sulphuric acid—1 to 10 parts acid to 100 parts distilled water or filtered rain water, or weak aquafortis. When the blade is withdrawn from the bath it must immediately be plunged into pure water to be quickly and completely washed, and then it is wiped and dried as rapidly as possible with a piece of old linen, soft leather, or a very dry sponge. It is then subjected for about five minutes to a dry heat in a furnace or oven heated to 70° or 80° centigrade; it is then withdrawn and again wiped.

The preceding operations have for their object the preparation of the iron or steel for impregnation with the alloy, the result being that the said iron or steel is perforated with a multitude of holes almost infinitesimally small. In iron, unless this metal is of excellent quality, the size of these holes is extremely variable, and sometimes there are defective parts which make the subsequent operations very difficult. In steel the difference of diameter of these holes is almost imperceptible, so that the subsequent operations are performed without difficulty. This is the chief reason of his preference for steel.

The knife-blade or other article after its preparation, as above described, is immersed in a metallic bath composed of the alloy made according to one or the other of the formulas hereinbefore given. The ingots are melted over a moderate fire in a crucible or pot formed of plumbago or refractory clay, and not in an iron vessel, as particles of the iron would mix with the alloy and render the same liable to oxidise in the open air, thus impairing the appearance of the impregnated knife-blade or other article. The iron or steel previous to immersion in the metallic bath or alloy must be heated to a temperature of 50° or 60° centigrade, the bath must be perfectly liquid, and is stirred with a dry rod of fir-wood or poplar, and the surface of the molten alloy must present a fine, silver-white colour, which is obtained by slow fusion and by stirring only when the whole of the mass is liquefied. If these precautions are observed the impregnation of the iron or steel will proceed rapidly, and the alloy will enter the artificially produced holes and the pores of the metal, which are slightly dilated by the previous heating of the said metal. For a knife-blade or similarly thin object an immersion in the alloy of a

very short time (say a few seconds) will suffice. A period of from two to five minutes will be required for pieces or articles of greater thickness, such as horse's bits, stable chains, and the like.

When withdrawn from the metallic bath the blade, or other article of iron or steel, is at once immersed in cold water, or is otherwise properly treated to harden or temper it, or to restore its temper as required. If left in the cold water for too long a time the metal sometimes becomes brittle, but carefulness on the part of the operator will prevent any difficulty of this kind. The blade, or other article, having been wiped and dried without the application of heat is polished in any suitable manner. It will then have the whiteness and lustre of silver, and will have a ring or sound analogous to that of the latter metal, and may be considered inoxidisable under ordinary atmospheric conditions. But to obtain a more nearly complete result, so that the article will resist corrosion by ordinary acids—vinegar, lemon, and the like—he gives it a second bath in an amalgam composed of mercury 60; tin, 30; silver, 1 = 100 parts. It is then either placed in hot molten silver, or has silver deposited thereon cold by means of electro-deposition, so as to obtain a new covering or coating to form part of the impregnating metal, as the latter forms part of the steel or iron.

The final operation consists in polishing the articles by rotating apparatus, suitable to the form of the blade or other articles treated, but the objects which are impregnated by means of the hot bath of molten silver are tempered again when taken out of said bath, and before they are definitely polished. The articles so prepared, whether originally made of steel, iron, bronze, German silver, or any other metal or composition capable of bearing the heat to which they will have to be exposed, according to his invention become remarkably hard and sonorous, these qualities resulting from the impregnation above described. He has described the process with respect to knife blades as an example, but desires it to be understood that other articles or objects of many kinds may be treated thereby with great advantage; for instance, the process may be applied with great advantage to many utensils in which inoxidisability is a valuable quality, and may also be applied for many industrial or manufacturing purposes. The process is not costly, and the difference in the price of article so made, and that of well finished goods manufactured in the ordinary manner, is amply compensated for by the saving in time and wear in cleaning. Thus, a knife-blade made as above described only requires to be cleaned by means of soft linen or wash-leather to preserve its appearance and silver polish. It can, moreover, be sharpened, and will keep its edge for as long a time as steel knife would do.

COMPARATIVE ENDURANCE OF IRON AND MILD STEEL WHEN EXPOSED TO CORROSIVE INFLUENCES.

An interesting paper on this subject was read before the Institution of Civil Engineers on Tuesday evening (Mr. Abernethy, F.R.S.E., presiding) by Mr. D. PHILLIPS, M.Inst.C.E., who was a member of the Committee appointed by the Admiralty in June, 1874, to enquire into the causes of corrosion in boilers, and since the dissolution of the Committee he had made further experiments with the same objects in view. The results were given of numerous tests, the surfaces of the specimens in nearly all cases being bright. Illustrations were shown of gutta percha and plaster of Paris impressions taken from many of the specimens. Tubes of different brands of iron and steel were subjected to various tests in a special apparatus at Sheerness Dockyard. Some of the tubes were welded, others were cold-drawn; with one exception they were all specially prepared. Each tube had an exposed surface of 9.58 square feet. The iron tubes lost 45.4 per cent. less in weight than the steel. Small discs of iron or steel were also tested in another set of tubes in the same apparatus. The percentage in favour of the irons was 56.7. Pieces of iron and steel of different brands were suspended for 12 months in two marine boilers, one vessel having a jet condenser, and the other a surface condenser, and also in a feed-water heater supplied with fresh water. The percentages in favour of the irons were 32.7, 27.5 and 11.8 respectively. Plates of Bolton steel and Lowmoor iron, 10 in. by 8 in., were likewise placed in the boilers of the two vessels mentioned. Half of the number were withdrawn after 13 months, and gave a percentage in favour of the irons of 32.7, corrosion in the steels, in the form of pitting, being most marked. Of the remaining eight plates, four remained in the boilers 21 months and four 22 months, the result being 28.6 per cent. in favour of the irons. Plates of the same two metals, 15 in. by 8 in., were suspended for 13 months in the feed-water heater. The percentage in favour of the irons was 10.9. The corrosion in the steels was only slightly more marked and irregular than in the irons. Plates of Lowmoor iron and Landore steel, suspended in pairs in vessels under slightly different conditions, gave a percentage of 4.8 in favour of the irons.

Reference was next made to a series of experiments with iron and steel plates (crucible, Bessemer and Siemens steels, and Staffordshire and Yorkshire irons), suspended in the boilers of ocean and coast-going steam-vessels belonging to various shipowners. The exposed surface of each plate was 37.89 square inches. Taking the results from 56 sets the percentage in favour of the two irons over the Bessemer and Siemens steels was 21.3. The different results obtained from some of the sets are carefully summarised in the paper. These results clearly proved the error of the conclusions arrived at by many experienced persons previous to the appointment of the Boiler Committee.

Experiments made by the author with plates similar to those last mentioned, placed in sea water, in rain water, exposed to the weather only, and exposed to the weather and dipped in sea or rain water daily, gave a result of 64.8 per cent. in favour of the irons, omitting the hard steel. The corrosion was strikingly local and severe in the set placed in rain water. Wetting the metals daily, especially with sea water, and exposing them to the weather caused very severe corrosion. The results of these experiments incontestably proved that under almost all circumstances iron, and especially the harder sorts, was far superior to steel in the resistance it offered to corrosion. Such theories as that corrosion was caused by galvanic action between metals and their oxides, or between different brands of iron or steel, or between iron and steel, were, in Mr. Phillips's opinion, practically unworthy of consideration. He then proceeded to say the steel had probably received more than its fair share of praise as regarded homogeneity and uniformity of temper. Although iron was inferior to steel as regarded cinders, laminations, &c., yet mild steel was not without original defects, as was shown by several of the gutta-percha impressions. Moreover, some of the tubes and discs before mentioned presented after testing a damasked appearance, similar to gun-barrels. Surprising differences of temper were exhibited in the cold bending of the metals tested in the tube apparatus, not only between the various brands, but also between the tubes of each brand. The difference between the behaviour of the tempered and the annealed steel specimens under the cold bending test was also most marked.

It would seem that in the purifying of metals, in order to render them more ductile, elements, such as carbon, phosphorus, &c., were eliminated, which no doubt rendered the metals more liable to corrosion. In the metals tested in sea-going boilers, the ordinary B.B. Staffordshire iron proved 9.6 per cent. better than the best Yorkshire, as regarded loss of weight, and the harder steel 20.9 per cent. better than the two mild steels. In the tube experiments the ordinary iron tubes proved 122.2 per cent. better than those specially prepared. Again, the tubes called improved metal were 31.1 per cent. better than the tubes called improved homogeneous metal, by far the most ductile and expensive of the two. It appeared from recent analyses that the percentage of phosphorus ranged from 0.20 to 0.21 in the cruder irons, from 0.7 to 0.14 in the better sorts, and from 0.016 to 0.04 in the milder steels. The amount of carbon in iron ranged from 0.0545 to 0.074 per cent., whilst in mild steel it varied from 0.131 to 0.273 per cent. From 0.0649 to 0.1080 per cent. of manganese was found in iron, and from 0.238 to 0.3317 per cent. in steel. These results confirmed the author's conclusions that the commoner irons, containing the most phosphorus, resisted corrosion better than the superior sorts, and the harder steels containing the most carbon better than the softer and finer sorts.

In conclusion, the author remarked that much yet remained to be

done to produce a metal at once strong and ductile, but at the same time better able than mild steel to withstand corrosion. On the other hand, the treatment of marine boilers might be so modified, especially with the aid of zinc properly applied, as to enable the purer metals to be used in their construction.

THE BEAUMONT COMPRESSED AIR LOCOMOTIVE.

Comparing the relative cost of animal and compressed air traction on tramways, Col. F. BEAUMONT, R.E., in a paper read by him before the Society of Arts, stated that now a tram car is actually drawn by two horses, value 80*l.* (about ten horses per car are required for continuous working), for which it is proposed to substitute an engine at a cost of 700*l.* Moreover, owing to gradients, the engine will require to vary its force very largely, and power has to be provided corresponding to the maximum inclination, however small a proportion the incline may bear to the rest of the road. A tram engine is, therefore, in a much worse position than a railway locomotive for showing economy as against horses, and this irrespective of other important considerations, such as unusual wear and tear from its machinery being close to a muddy road, or the shaking due to running on an uneven track. After summarising the results which have been obtained in actual practice with his engine, he offered a few remarks on the theoretical conditions involved in the use of compressed air. The No. 1 engine, made by Messrs. Manning, Wardle, and Co., of Leeds, was run for three or four months in the grounds of the Royal Arsenal, Woolwich, where in course of continual work it drew a gross load of 22 tons—11 miles, and 12 tons—21 miles respectively, with one single charge of 100 cubic feet of air. It subsequently made a trip of some 16 miles on the South-Eastern Railway from Dartford to Woolwich and back. It was then run on the Metropolitan (Underground) Railway. The engine and carriage together weighed about 20 tons, and over that line, with some fairly heavy curves and gradients, the duty done was 3 tons conveyed one mile for an expenditure of 1 cubic foot of air at 1000 lbs. initial pressure.

In the course of the discussion which followed Mr. Perrett remarked that, whilst wishing Col. Beaumont every success, he feared that his views as to the application of his system to tramways were rather too sanguine. He had stated the traction at 25 lbs. to the ton, and that might be so where the tramway was new and good and the road clean, but from some practical experience he knew that 45 lbs. to 50 lbs. would be nearer the mark as an average, and, therefore, half the power was gone at once. His calculations referred to a practically level line; and it would be the same thing where the gradients did not exceed 1 in 100 or 1 in 80, because what you lost in going up hill would be gained in going down; but with anything beyond that you required an excess of power in going up, and to put on the breaks going down. On the majority of level tramways the companies were satisfied with horses, but they wanted mechanical power to work them up over steep places, but for such places it seemed to him that compressed air was satisfactory. He had in his mind two towns, one of which had an average gradient of 1 in 34, rising in some places to 1 in 17, for 4000 yards. In that place they were very anxious to have some mechanical power, but if horses could do the work, he, though an engineer, must confess he should prefer them to any mechanical arrangement if it could be done for the same money. To his mind it depended far more on the simplicity of the engine and on the absence of repairs than on anything else. The cost of repairs with steam was enormous compared to any other item, even that of fuel. If coals cost 3*d.* or 3*d.* a mile, repairs would cost 2*d.* and 2*d.* In fact the drivers' wages came to more than the coal. Again, the efficiency of this new engine seemed to depend on having a small boiler attached to it, but for his part he should much prefer it if this could be dispensed with. Compressed air had many advantages, but it must be compared with the steam-engine of the present day, not with what it was some years ago.

THE HOWLAND PULVERISER.

The essential feature of the new pulveriser at present being introduced by Messrs. Morey and Sperry, of New York, is the making of the wearable parts renewable. The wearing parts are made of the hardest iron in duplicate, and can be changed with less trouble than the shoes of the stamp-mill, and no keys or bolts are required to hold them. There is an L-shaped ring of the full diameter of the inside of the machine, and there likewise are rings or rolls 10 in. in diameter, 4½ in. face; 12 of these are used upon the disk-plate, which must run from 175 to 180 revolutions per minute; the rings rest partly upon the outer ring, which is stationary. The motion of the disk-plate imparts a peculiar motion to the rings or rolls, they turning as it were upon a central axis, spinning like tops, while the whole 12 at the same time run around the large circle, being thrown off by centrifugal force. The pulverising is done between the rolls or rings and the outer ring. The aggregate weight of all the wearing parts is about 2135 lbs. The machine will pulverise from 500 to 750 tons of ore to 40-mesh and finer, with one set of the wearing parts, which is less wear or loss of iron than in stamping the same amount of ore to same grade of fineness.

The ore is fed through an opening in the top of the bonnet casing; immediately on falling upon the revolving disk-plate it is carried outward by centrifugal force to the rings or rolls, and when pulverised fine enough is ejected through the screens to a circular trough conveying it to copper plates for amalgamation, or run into tanks for settling. The machine can also be constructed for dry pulverising, when it will accomplish about one-fourth less than when wet. The frame for the machine is made of pine timber, is mortised and tenoned throughout, and held by strong joint-bolts. Each machine is put together at the works, and finished, marked, and taken down for shipment. An automatic feeder is provided especially for this machine that will feed the ore continuously, as well as a rock-breaker, adapted to breaking the ore to the proper size for this machine, which must be no larger than 1 in. It is claimed that this machine will pulverise wet hard quartz rock to a fineness that will pass through a 40-mesh screen 1 ton per hour, and will pulverise dry to pass through a 60-mesh screen ½ to ¾ ton per hour.

The great recommendation, however, which the pulveriser is believed to possess is that every exposed part of what might be termed the wearing castings—that is to say, the pan ring, the revolving disk-plate, and the rolls are continually passing and repassing each other at different points with a rolling and grinding action, insuring a maximum of wear from a minimum of metal. These wearing castings are not held in the machine by a single bolt, but simply by gravity alone, hence are easy of removal when worn too thin for further use. It can be set up and run in a few hours after arriving on the ground, and requires no expensive foundation. All the parts of the machine are made to gauge, so that duplicate parts can readily be obtained. The total weight of the machine with frame complete is less than 3½ tons, and the weight of the heaviest piece scarcely exceeds 7½ cwt. With these recommendations, and the fact that from 12 to 15 horse power is sufficient to drive it, it is confidently anticipated that in many mining districts the use of the machine will become general.

PETROLEUM IN VENEZUELA.—A very remarkable deposit of petroleum is described by the American Consular-Agent at Maracaibo as existing between the Rio Tara and Zulia. Near the former there rises a sand-bank about 35 yards in extent and some 10 yards in height. On its surface is visible a collection of cylindrical holes, apparently artificially made and of different diameters, through which streams of petroleum, mixed with boiling water, gush out with great violence, accompanied with a noise as though two or three steamers were blowing off steam. The column of vapour that ascends from it would doubtless be seen from a long distance were it not shrouded by the thick forest, to which the petroleum beds that evidently lie underneath give perpetual greenness and freshness of foliage. Dr. McGregor states that from one of these holes, notwithstanding the difficulties of the position, he filled in 42 seconds a vessel containing 15 bottles, or as fast as 4 gals. per minute, or 240 gals. per hour, or 5760 gals. during the 24 hours. A curious phenomenon has been occasionally seen in Venezuela ever since the conquest, consisting of

frequent lightning without any explosion, which is observable from the bar at the entrance of the Lake of Maracaibo, close to the island of Bajoseco, and which Col. Codazzi, in his geography, attributes to the vapour ascending from the Cienega de Agua Caliente. This appearance, called by mariners "El farol de Maracaibo," is more probably due to the inflammable gas, that permeates the whole district to such an extent that it is known by the natives as El Inferno. There is no doubt that the supply of petroleum is very abundant not only here but in the neighbouring republic of Colombia, where, between Esouque and Bettioque, the labourers gather it up in handkerchiefs, which, when saturated are squeezed out into barrels.

THE COPPER TRADE.

During the quarter ending March 31, 1881, the quantity of copper ore, the produce of Cornwall and Devonshire, sold at the Cornish Ticketing, was 9870 tons, which contained 641 tons 16 cwt. of fine copper, and realised 35,089/19s., being equal to an average of 3/11s. 1d. per ton of ore, and 54/14s. per ton of copper in the ore. During the same period the British, colonial, and foreign ores sold at Swansea amounted to 5719 tons, which contained 446 tons 14 cwt. of fine copper, and realised 26,329/19s. 6d., being equal to an average of 4/12s. 1d. per ton of ore, and 58/18s. 10d. per ton of copper in the ore. The average produce of the ore sold at Cornwall Ticketings was 64 per cent., whilst that sold at Swansea gave an average produce of 71.16 per cent. From this it will be seen that the aggregate sales by ticket were 15,899 tons of ore, containing 1088 tons 10 cwt. of fine copper, realising 61,419/18s. 6d. The subjoined is a summary of the periodical sales at the Cornwall and Swansea Ticketings respectively. The ores sold at the Cornwall Ticketings were—

| Date. | Standard. | Prod. | Price. | Per unit. | Tons. | Fine cop. | Amount. | | | | | | |
|-----------------------------------|-----------|-------|--------|-----------|-------|-----------|---------|-----------------|-----------|--------------|------------|------------|-------------|
| Jan. 6. | 498 | 7 | 0 | 6 1/4 | 43 | 8 | 6 | 10s. 11d. 1,114 | 69t. 18c. | £ 3,812 18 0 | | | |
| " 20. | 95 | 6 | 0 | 6 1/4 | 3 | 13 | 6 | 10 11 | 2,884 | 194 8 | 10,596 2 0 | | |
| Feb. 3. | 95 | 11 | 0 | 6 1/4 | 3 | 17 | 6 | 11 | 2 | 943 | 65 6 | 3,647 7 6 | |
| " 24. | 100 | 5 | 0 | 5 7/8 | 3 | 4 | 0 | 10 | 9 1/2 | 2,207 | 131 0 | 7,063 13 0 | |
| Mar. 3. | 99 | 13 | 0 | 6 1/4 | 3 | 9 | 6 | 11 | 1 1/4 | 758 | 47 3 | 2,620 15 0 | |
| " 24. | 95 | 3 | 0 | 6 1/4 | 3 | 15 | 0 | 10 | 11 1/2 | 1968 | 134 1 | 7,349 3 6 | |
| Total for the quarter | | | | | | | | | | | 9,870 | 641 16 | 35,089 19 0 |
| Quarter ending Dec., 1880 | | | | | | | | | | | 10,174 | 698 9 | 36,350 7 0 |
| Quarter ending Sept., 1880 | | | | | | | | | | | 10,433 | 705 17 | 36,505 17 0 |
| Quarter ending June 1880 | | | | | | | | | | | 9,936 | 689 13 | 37,566 18 0 |
| Total for the year | | | | | | | | | | | 40,413 | 2,733 15 | 145,513 1 0 |
| Showing a quarterly average of | | | | | | | | | | | 10,103 | 683 9 | 36,378 5 0 |
| Corresponding quarter March, 1880 | | | | | | | | | | | 9,768 | 682 2 | 40,413 9 0 |

The ores sold at the Swansea Ticketings were—

| Date. | Standard. | Prod. | Price. | Per unit. | Tons. | Fine cop. | Amount. | | |
|-----------------------------------|-----------|-------|--------|-----------|--------|-----------|---------|-----------|---------------|
| Jan. 4. | 484 | 16 | 9 | 7 1/2 | £4 9 5 | 11s 8d. | 1,783 | 136t 8c. | £ 7,973 10 0 |
| " 25. | 82 | 13 | 6 | 7 1/2 | 4 6 | 11 4 1/4 | 1,414 | 107 16 | 6,113 18 0 |
| Feb. 15. | 87 | 6 | 4 | 9 | 5 12 2 | 12 4 | 1,140 | 103 14 | 6,395 17 6 |
| Mar. 15. | 86 | 2 | 2 | 7 1/2 | 4 4 7 | 11 10 | 1,382 | 98 16 | 5,846 14 0 |
| Total for the quarter | | | | | | | 5,719 | 446 14 | £26,329 19 6 |
| Quarter ending December, 1880 | | | | | | | 5,183 | 448 18 | 24,514 12 6 |
| Quarter ending September, 1880 | | | | | | | 7,976 | 674 2 | 37,549 16 0 |
| Quarter ending June, 1880 | | | | | | | 5,520 | 535 14 | 31,460 10 0 |
| Total for the year | | | | | | | 24,398 | 2,105 6 | £119,834 19 0 |
| Showing a quarterly average of | | | | | | | 6,099 | 526 6 1/2 | 29,963 14 6 |
| Corresponding quarter March, 1880 | | | | | | | 5,717 | 545 0 | 36,196 5 6 |

NEW TRUMPET CONSOLS—SPECIAL REPORT.

The following are a few points of interest in connection with this now most important and extensive sett, which, with additions lately acquired, form a property of between 350 and 400 acres. From the fact that there is ample water-power for all the purposes of the mine, saving thereby expenditure in the way of steam, very large profits are anticipated. Franchise Lode: This lode has been very productive, yielding large returns from an extensive run of tin ground, of which there is yet 200 fms. in length along its course unexplored. This will be most economically developed by the drive of an adit level eastward on the course of the lode from a point near the western boundary and in the lowest part of the valley.—Noon Lode: For a length of nearly 400 fms. on the course of this rich and productive lode the ground is entirely whole, and can be most conveniently worked. If necessary, and until the adit level is driven far enough, and the engine that is now erected on this portion of the property can be immediately set to work, the mine would be quickly forked and returns of tin commenced forthwith.—Valls Lode: This lode remains unexplored, except to a very trifling extent, throughout the whole of Trenethick and Trelubus, and notwithstanding its only partial development most extraordinary returns have been made therefrom. At the 143 fms. level a winze was sunk communicating with the 153, and from a very narrow channel of ground laid open for stoping at this point 1500t. worth of tin was raised. The ends of the levels having been driven a very long way from the shaft on the course of the lode, and with black tin at 30t. to 35t. per ton, profitable working was out of the question. By the extension of the adit level, however, the whole of these rich deposits proved throughout the property will be commanded, and should it be found expedient to sink a permanent shaft on the top of the hill rods can be conveyed from the water-wheel, so saving all expense of fuel, &c. The great fact remains, therefore, that on the Valls lode the ground is entirely whole, and proved to contain great bodies of tin from the back of the 143 to surface. The results likely to be derived from this alone are thought sufficient for dividend purposes without taking into consideration the points previously referred to. It is a mastery lode, showing great regularity in its production, and making a continuous bunch of tin from a few fathoms from surface. There are also two parallel lodes between the Valls and Whidden lodes; these can be almost immediately explored. There is ample steam power (if it should be required) and the necessary appliances for dressing on the mine, and it is confidently expected that profits will be made forthwith.

From Mr. JOHN B. REYNOLDS.—The stock and share markets have, on the whole, been steady during the past week, but at times the fluctuation in rails has been decidedly in favour of buyers. The reaction is a natural one after the undue inflation of the past, and investors would do well to remember that a period of speculative excitement is certain to be followed by one of corresponding depression. This result is caused no doubt generally through the inability of speculators to take up stock, and when their position is known by those who operate for the rise no time is lost in taking advantage of their unfortunate position. At this moment there is a flutter of anxiety discernible amongst the holders of gas shares; nor is this to be wondered at. The advance of science will not pause for the benefit of the holders of gas shares. Moreover, they have had a very rich harvest at the expense of the public, and are not likely to get any sympathy from those not immediately interested in gas companies. The future for gold mines cannot be said to have subsided, even if it has abated. Here we shall have the old story of "disappointment," "falling markets," &c., repeated over again, perhaps sooner than we expect. But it is reasonable to assume that there will be some companies paying investors fairly well. The parties who are likely to be the most seriously compromised are those who will be unable to stand the test of time, or when the critical hour arrives to substantiate the statements which are being so freely circulated. The improvements in British mines have been steady but sure. The tin market has been quiet but strong, with a decided upward tendency. The large producing tin mines, which are paying handsome dividends even with the present price of tin, may be considered sound investments—for instance, East Pool pays a quarterly dividend of 1/2 per share, and is likely to do this at least for many years to come, whilst Dolcoath (the Consols of tin mines) will undoubtedly increase its dividends.

There is a growing detestation of having mining accounts presented in anything like an ambiguous form, and shareholders are getting very decided upon insisting that mines shall be conducted on a similar principle—ensuring a maximum of safety with a minimum of risk, as far as unknown liability is concerned. We think the no concealment method is asserting itself effectually, and those who strenuously uphold it will be heard by, and have the confidence of, the public. The main feature of the week has been the rise in Blue Hills, West Bassett, East Pool, West Kitty, and a few other well known mines. The advance has been inconsiderable, but well sustained. Those who study the returns from these properties will be able to arrive at an accurate conclusion as to their future. Generally, in all well regulated mines, information is reserved for the shareholders who like to see it, and is not volunteered to the public. Therefore, we think it both unfair and unreasonable to severely criticise any particular company for adopting a course of procedure which is, to the shareholders at least, advantageous. Amongst mines of the more speculative character North Bury has been subject to comments which are not altogether favourable. If the North Bury agents are satisfied as to the value of the property their course is clear enough, and they will be wise if in future they work the mine in such a manner as will not admit of anybody supposing that it is worked for market purposes, and present their accounts in the most methodical manner, and pay everything they owe. We pointed out some time ago that an extension of the limits of this property would be advisable, but this idea was not taken up at the meeting.

Why South Frances should not make a call to pay its indebtedness we cannot comprehend. Speaking generally, it is time for the shareholders in mines to take a bold and determined stand against the heavy debit balances. Bankers have to be paid considerable interest, merchants take care to get a large profit out of mines seeking credit, and everybody except the shareholder is benefited at the expense of the latter. If there are shareholders holding such large interests in mines as to render it imprudent, as far as they are personally concerned, to make adequate calls to pay up debts, then we submit that those shareholders should either decrease or sell out their interest. It is monstrous that to

suit their convenience the capital of a large body of shareholders should practically remain dormant, and the mining interest generally be so discredited. On the other hand, however, it must be admitted that the small shareholders acquiesce when they assent to a resolution authorising an overdraft at the bankers. Our correspondents who feel interested in this matter have only to persist in the course they approve to get the sympathy of the public and a safe and certain remedy ultimately.

WATSON BROTHERS' MINING CIRCULAR.

WATSON BROTHERS
MINEOWNERS, STOCK AND SHARE DEALERS, &c
1. ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

The GWYDYR AMALGAMATED MINES COMPANY (Limited) has, as we stated last week, been duly registered, and the property made over to it, so that the shareholders in Aberllyn, D'Eresby Consols, and Clementina will shortly receive their proportions of shares, and it will only require a little more money to make the mines, we trust, a grand success. But this money must be had to work the mines, and if every shareholder will come forward and take in addition only a few shares each, enough will be got rid of to ensure the necessary working capital. It should be remembered that to old shareholders these shares will be issued at 10s., 1/1 fully paid up, and will give them the option of calling for the like number of shares at 10s. at any time during 12 months. We stated some weeks ago that we had secured 4000 shares on these terms, and we placed them among applicants. It is for the old shareholders now to come forward and claim the rest. A discovery of lead at Aberllyn, which may shortly occur, would send the shares to 1/1 each or higher, and at 10s. they are offered to old holders as a great boon.

Such was the prejudice against the eastern district of Cornwall, and the idea of copper making in Killas, or, in fact, in any strata that men of the western district did not understand or approve of, that South Caradon when first discovered went begging, and no one in the West of Cornwall would touch it. We perfectly remember when Captain J. Clymo first came to London to try and dispose of the sett—he brought with him, as we thought, most beautiful stones of ore, but no one would take up the concern, so he returned home, and on his way he travelled in the coach with a gentleman who was for a great number of years a client of ours, and Clymo offered him half the mine, 32-64ths, at 5/1 per share. This offer was declined, so the Clymos, James and Peter, and Mr. Kittow, started the mine themselves, and made very large fortunes out of it. In less than 12 months from the time our friend refused the shares at 5/1 each they were at 2000/1, and in 1838 the mine commenced dividends, and has paid over 200,000/1. We remember being on the mine with the Clymos and the purser when it was making its greatest returns, more than 20 years ago, and we said "what are such and such ends worth." "Nothing," was the reply. In fact, Peter Clymo said "We have not at present an end in the mine to value. Our ends are often in poor ground, but between the levels we are full of ore." This remark was forcibly called to our mind, by what Capt. Holman said at the meeting last week, "that they had sunk in the mine 100 fms., and driven 300 fms. without having any ore, and what would shareholders have said had he reported it month by month," or we may say week by week, as most mines do. Probably half of them would have been frightened out of their shares. From these remarks we may gather two or three scraps of comfort—not to be disheartened at delays, or if an end sometimes falls off, if you are satisfied with the *bona fide* nature of the speculation; neither regard the talk of agents when it is only the colour or the nature of the strata they do not like. No certain rules can be laid down on this head. Soon after South Caradon, West Caradon adjoining, and for the same reason, was condemned by one of the most practical agents in the western district, so that those who had applied for a lease forfeited the deposit rather than take the sett. Then the Quakers took it up, and upon a small outlay began profits in 1844, and divided nearly 150,000/1.

These circumstances also show us that it has been by steady perseverance that most of our rich mines have been made. Shareholders who buy simply for a rise in shares on the market merely gamble as they do in any other kind of stock, and are not miners at all.

The new shares in the Santa Barbara should, we think with our correspondent, have been issued to old shareholders at par, and not at cent. per cent. premium. At par they would have been a bonus to them, and a salve for disappointments of late.

According to the report of Capt. Daw, Devon Friendship should be in a position in May next to commence profits at the rate of 520/1 per month, which would give a good dividend to begin with.

There are no "salaries" to directors in cost-book mines, and the amounts paid in limited companies are not always regulated by the mining experience of the men selected. In one company lately brought forward the Chairman gets 300/1 a year, and four other directors 200/1 each: 1100/1 a year for directors alone. Now, let us look at a cost-book mine, and take Wheal Crebor as an example. The committee consists of three practical men of business, one of whom has been on the direction for 20 years. The mine is paying at the rate of 6000/1 a year in dividends, and the committee meet every month, audit all the accounts, and examine cost sheets and pay them; for this they get 1/1s. each attendance. Thus the cost for a mine like this paying good dividends is about 50/1 a year, against 1100/1 on the "limited" principle.

And we challenge any mine, "limited" or "cost book," to produce clearer or more satisfactory accounts than those of Wheal Crebor.

The great open-cast by Colonel's shaft, at Pary's Mountain, is about 90 fms. wide, and the 90 cross-cut south has been driven about one-third of the distance; it has, therefore, to be driven 60 fms. further and may meet some great deposit in its way. The boring machinery will go to work in about a week. The copper pyrites are about to be tested for gold.

The great point in the Kirk Michael is to get the shaft down to the junction of the great Slide vein, and where great results are anticipated. In a precisely similar and analogous junction at Foxdale, a few miles off, a profit of 300,000/1 was made from one of the largest deposits of ore ever discovered. Writing of this, when the company was formed, Captain Rowe expressed himself satisfied that some such results would follow at Kirk Michael. He inspected the Foxdale discovery in 1845, and is therefore qualified to judge. The shaft is now down to a 14 fm. level below the adit, and driving commenced under a continuous course of ore for more than 50 fms. long. Good returns, therefore, will be made, while the grand speculation is in progress.

At Prince of Wales the 90 east is not yet cut at the cross-course; 90 west shows indications of early improvement.

At Carnarvon the slide is gradually drawing the water from the side sump. Large pumps have been put in, to prevent any accident.

The lode has now been cut through at No. 6 at D'Eresby Mountain; it has contained lead here and there all the way through; and in the heading now cut it is compact and regular for 2 or 3 feet wide, with a rich mixture of lead ore; and letting out streams of water. The agent writes us this morning: "We entertain the highest hopes of this point, and think too much importance can scarcely be attached to it, for this heading has been seen nowhere by us below the No. 4, and should this part of the lode prove to be the most productive to any extent, it can be attacked by cross-cuts at different points, which may lead to very great results."

Application has been made to the Stock Exchange Committee to appoint a settling-day in the following securities and allow them to be officially quoted:—Mysore Reef Gold Mining Company (Limited)

shares, Callao "Bis" Gold Mining Company (Limited) shares, Ooreum Gold Mining Company of India (Limited) shares, Oldham Corporation 100,000/1 debenture-stock; Indian Glenrock Gold Mining Company (Limited) 40,000 new 1/1 shares.

Registration of New Companies.

The following joint stock companies have been duly registered:—

NORTH WALES UNIONISTS' QUARRIES COMPANY (Limited).—Capital 50,000/1, in shares of 1/1. To carry on the business of quarry proprietors and slate merchants. The subscribers are—W. J. Griffith, Glanllyn, 1; H. Parry, Clwtybont, 1; J. Jones, Bryntirion, 4; O. Jones, Cwm-y-Glo, 1; W. Owen, Llanrny, 20; R. Parry, Llanrny, 20; H. Jones, Portmadoc, 1; R. Parry, Bethesda, 10; J. Evans, Llanllechid, 2.

THE MIDDLESEX LAND COMPANY (Limited).—Capital 50,000/1, in shares of 10/1. To carry on the business of a land and building society in all branches. The subscribers are—J. W. Stutterfield, Fulham, 40; G. Edwards, 68, Brompton-road, 100; W. Cleghorn, 131, Brompton-road, 100; W. Cox, 121, Brompton-road, 100; W. T. Bates, 89, Brompton-road, 50; W. Cutbush, 27, Hill-street, 50; C. W. Blackman, 4, Highbury Grove, 1.

THE WHEELER HORSE SHOE NAIL COMPANY (Limited).—Capital 20,000/1, in shares of 5/1. The manufacture and sale of horse shoe and other nails in connection with certain patents. The subscribers are—E. Pocock, Clapham, 100; W. H. Duncan, Stafford, 50; C. F. Gardner, 1, Worship-street, 100; J. Turner, 94, Gracechurch-street, 5; J. Barnard, 2, Talbot-court, 5; W. Walker, Stafford, 20; G. Hagger, 1, Worship-street, 5.

THE PIONEER PAINT COMPANY (Limited).—Capital 20,000/1, in shares of 10/1. To carry on the business of paint, colour, varnish, and whitewash manufacturers. The subscribers (who take one share each) are—W. Puzey, 5, Aldermanbury Postern; A. Gerden, Dalston; H. F. Thlee, 31, Aldermanbury; C. W. Ford, 96, Lambeth-road; C. E. Scott, Brighton; H. Becher, 9, Hatton Garden; E. McBride, Barnes.

BRILL'S SEA-WATER BATHS, LONDON (Limited).—Capital 100,000/1, in shares of 1/1. To carry on in London the business of bath proprietors, restaurant keepers, &c. The subscribers (who take one share each) are—S. S. Ellis, Stoke Newington; S. Barrett, 16, Percy-street; J. Stephenson, 26, Suffolk-street; W. H. Cook, 46, Queen Victoria-street; O. R. Mason, Barnes; F. Seranke, Torquay; J. S. Fisher, 202, Commercial-road.

THE MADAGASCAR AND INTERCOLONIAL STEAM SHIPPING COMPANY (Limited).—Capital 50,000/1, in shares of 5/1. To carry on a shipowner's business in all branches. The subscribers (who take one share each) are—J. Porter, 63, Fenchurch-street; R. B. Hewitt, 49, Cornhill; G. H. Benporath, 6, Little Tower-street; G. Johnson, 23, Ironmonger-lane; R. C. Mills, Sutton; T. T. Porter, 63, Fenchurch-street; H. B. Payne, 32, Gresham-street.

THE ROMANIAN HOTEL COMPANY (Limited).—Capital 50,000/1, in shares of 10/1. To carry on an hotel keeper's business in that State. The subscribers are—C. Rothschild, Bucarest, 100; W. Morris, Blackheath, 1; W. Tipping, Kent, 1; J. Morris, 6, Old Jewry, 1; P. B. Hayes, 53, Coleman-street, 1; A. A. Kees, Lower Clapton, 1; W. H. Adams, 30, Peckham Grove, 1.

GUAYANA GOLD MINING COMPANY (Limited).—Capital 250,000/1, in shares of 1/1. To adopt and carry into effect an agreement made between J. B. Austin, of Philadelphia, and T. M. Perot, of same City, on behalf of the South American Mining Company, therein referred to as the "Old Company," of the first part, and J. F. Hamilton as trustee of the other part, for the acquisition, on terms therein stated, of certain mines, mining, and other properties, stock-in-trade, rights, and effects situate in Venezuela, and belonging to the said South American Mining Company, working these and any other suitable properties. The manufacture, smelting, and reduction of ores, minerals, and produce, and the purchase and sale of gold and other metals, ores, and mineral produce. The subscribers (who take one share each) are—J. T. Hamilton, 5, Crosby-square, secretary; R. J. H. Arbuthnot, Hexley, gentleman; W. Macbean, 14, St. Mary Axe, merchant; J. C. Sanderson, 38, Mincing-lane, gentleman; B. Hallam, 63, Besborough-street, journalist; W. A. Malcolm, 5, Crosby-square, merchant; H. Slaney, 35, Malpas-road. The number of directors must not be less than four or more than seven.

THE HARZER NATURAL MINERAL WATER COMPANY (Limited).—Capital 100,000/1, in shares of 1/1. The manufacture and sale of any mineral water, natural or otherwise. The subscribers (who take one share each) are—F. A. Abraham, 135, London Wall, 100; H. S. Foster, 3, Cophthall Buildings, 20; C. Hight, 3, Cophthall Buildings, 20; H. Bartling, Leadenhall House, 1000; W. Doherty, 6, Great Newport-street, 25; R. C. Child, Hampstead, 20; P. F. Marks, 30, Dorset-square, 20.

LIVERPOOL DAIRY COMPANY (Limited).—Capital 20,000/1, in shares of 10/1. To sell milk, cream, butter, and all other kinds of dairy produce. The subscribers (who take one share each) are—T. Mathison, Liverpool; A. Balfour, Liverpool; J. Sing, Liverpool; S. J. Menzies, Liverpool; E. T. Woodward, Liverpool; F. Tuloch, Liverpool; A. Billson, Liverpool.

THE TREWITTEN MINING COMPANY (Limited).—Capital 12,000/1, in shares of 1/1. To purchase upon terms set forth in a certain agreement made between C. Holman, on the one part, and A. E. Jarvis, as trustee for the company, a lease, grant, or sett of the mines minerals, and other rights therein mentioned. To work and develop these or any other properties that may come into possession of the company. To deal in, sell, and dispose of ores and minerals generally, and carry on all operations in connection with a mining and smelting company. The subscribers (who take one share each) are—J. J. Rasdon, 78, Hatton-Garden, clerk; A. Jarvis, 8, Guildhall-chambers, accountant; R. J. C. Meyhew, 8, New Inn, solicitor; F. C. Abbott, Brighton, gentleman; W. Park, 3, Cophthall-chambers, clerk; R. Clapperton, 26, St. Mary-Axe, clerk; A. Simmons, Battersea, clerk. A director's qualification to consist of stock to the nominal value of 50/1. The number not to be less than three or more than five.

THE GREAT POLGOOTH UNITED TIN MINES COMPANY (Limited).—Capital 100,000/1, in shares of 1/1. To purchase or otherwise acquire of W. Lewis certain tin and other mines, called Mulvra and Tregongtrees, situate in the parish of St. Austell, Cornwall, with the appurtenances, to work and develop the same respectively, and to deal in and dispose of the products thereof. To acquire any other mining properties in England or Wales, to work, sell, underlet, or otherwise dispose of same. The subscribers (who take one share each) are—J. J. Arnall, Kingsland, clerk; C. Gell, Leytonstone, telegraph engineer; W. Forsyth, Camden Town, gentleman; T. H. Lodge, Chelsea, gentleman; E. Godts, Hampstead; W. Mason, 4, Richard-street, agent; T. Smith, Bow, chemical agent. The subscribers will appoint the first directors, whose number must not exceed seven or be less than three.

THE SIMONS REEF CONSOLIDATED GOLD MINING CORPORATION (Limited).—Capital 120,000/1, in shares of 1/1. To acquire by purchase or otherwise any lands for mining purposes, mines, minerals, mining rights, and other property, in Southern India, and particularly the Simons Reef, for the purposes of carrying on the business of miners, prospectors, and generally that of a gold mining company. The subscribers (who take one share each) are W. Oxley, 86, Regent-street, accountant; G. J. Snow, 9, King's Arms-Yard, gentleman; H. Elliott, 41, Threadneedle-street, secretary; J. K. L. Hopwood, Peckham-Rye, gentleman; W. R. Horncastle, 61, Cheap-side, advertising agent; J. Coombs, 33, Aldebert-Terrace, gentleman; G. H. Howe, 7, Lancaster-road, gentleman. No articles are registered.

DINGLEY DELL ESTATES AND GOLD MINING COMPANY (Limited).—Capital 100,000/1, in shares of 1/1. To purchase or otherwise acquire lands, estates and properties in India, and particularly certain estates of 600 acres situate in the Nilgiri district of the Madras Presidency, to improve and cultivate same, and work the gold mines, minerals, and mining rights under or upon the said estates. To crush, smelt, wash, and reduce and amalgamate the ore, sell or otherwise dispose of the produce, and develop the resources of said or any other properties. The subscribers (who take one share

each) are—W. M. Cochrane, Seymour Chambers, Colonel; J. Paterson, 20, Paulet-road, Inspector of Machinery; E. A. Saunders, Plympton, Major-General; J. W. Clark, 152, Wool Exchange, merchant; T. W. Martin, 2, George-street, secretary; F. Wingrove, St. Peter's-square, no occupation; E. Gibbins, Beddington, accountant. The qualification for a director is fixed at 250 shares.

THE SANTA CRUZ SULPHUR AND COPPER COMPANY (Limited).—Capital 200,000*l.*, in shares of 1*l.* To acquire as per agreement the interests in certain copper and sulphur mines and mineral properties, situate in the parish of Santa Cruz de Moeche, province of Coruña, Spain, known as the Dos Amigos and Guillermo Mines, now vested in the New Tharsis Sulphur Company (Limited), and all the sulphur, copper ore, and mineral deposits and substances found therein. To work and carry on all or any of the said mines, also that of a mining, smelting, trading, and metallurgical company in all branches. The subscribers (who take one share each) are—P. F. Gladstone, 2, Norris-street, gentleman; A. N. Sherson, 3, Coleherne-road, gentleman; P. Carnegie, Norwood, C.S.T.; M. Cochrane, 1, Seymour Chambers, colonel; F. L. Knowles, Ryde, baronet; W. Baxter, 184, Gresham House, gentleman; J. J. Towner, 184, Gresham House, secretary. The first directors are—Sir F. L. Knowles, Colonel Cochrane, and Messrs. Gladstone and Sherson.

IMPERIAL CREDIT COMPANY (Limited).—Capital 692,887*l.* 10*s.*, in shares of 7*l.* 10*s.* To negotiate loans of all descriptions, &c. The subscribers (who take one share each) are—J. F. Darley, 220, Cromwell-road; C. Cheney, Homerton; W. Gray, 38, Keppel-street; T. F. Riches, Nunhead; C. Kealy, Tollington Park; E. L. Jordan, Redhill; S. Gorringer, Brockley.

THE WEST VIRGINIA LAND AND LUMBER COMPANY (Limited).—Capital 125,000*l.*, in shares of 20*l.* To carry on a land, lumbering, paper pulp manufacturing, and tanners business. The subscribers (who take one share each) are—H. Mainwaring, 25, Duke-street; C. Alston, Odell; J. L. Vivian, 3, Pall Mall East; J. Skinner, 2, Beaumont-crescent; J. Milne, 312, Mansion House Chambers; C. B. G. Cole, 36, Welbeck-street; W. M. Gow, 167, Piccadilly.

THE COMMERCIAL FINANCE COMPANY (Limited).—Capital 50,000*l.*, in shares of 1*l.* To carry on financial operations in connection with trade. The subscribers (who take five shares each) are—E. B. Harding, Tavistock House; G. A. Griffiths, 35, Carlton-hill; J. S. Ward, 31, Lincoln-inn Fields; W. Hudson, 37, Moorgate-street; B. W. Jones, 11, Queen Victoria-street; J. H. Addison, Eastbourne; E. F. Wheeler, 70, Queen-street.

THE CARTA PARA GOLD MINING (Limited).—Capital 50,000*l.*, in shares of 1*l.* To acquire any mining and mineral properties in Southern India or elsewhere, to work and develop same, and to carry on the business of raising, working, winning, and selling ores, metals, and other minerals, and generally that of a gold mining company in all branches. The subscribers (who take one share each) are—W. Lichfield, Lee, gentleman; W. Oxley, 86, Regent-street, accountant; G. J. Aman, 9, King's Arm Yard, gentleman; H. Elliott, 41, Threadneedle-street, secretary; J. K. L. Hopwood, Peckham Rye, gentleman; F. S. Muckleham, 16, Mark-lane, merchant; H. C. Doman, Brixton, accountant. Number of directors not to exceed five or less than three.

NAUTILUS STEAM SHIPPING COMPANY (Limited).—Capital 125,000*l.*, in shares of 25*l.* To ratify certain contracts, and carry on generally a shipowner's business. The subscribers are—F. Ristson, Sunderland, 200; R. H. Potts, East Boldon, 90; C. Howard, Hampstead, 80; H. Ristson, Sunderland, 80; J. Firth, Sunderland, 40; W. Ristson, Sunderland, 60; G. Haswell, Sunderland, 40; R. A. Bertram, Sunderland, 40; J. Morgan, Sunderland, 50; T. Christal, Sunderland, 20.

THE UCHA UNITED MINES (Limited).—Capital 10,000*l.*, in shares of 10*l.* To acquire the Ucha United Mines on terms made between M. King and W. Hope as trustees to the company, and any other mining lands or properties in Wales or elsewhere. To develop, open up, and work the mines, and generally to carry on the business of a mining company in all its branches. The subscribers (who take one share each) are—W. Sarl, New Cross, colliery owner; J. M. Buckley, 78, New-street, mining engineer; E. Applegarth, 15, Angel-court, engineer; T. W. Martin, 32, St. Swithin's-lane, accountant; A. D. Griffith, 3, West-street, accountant; S. C. E. H. Walmsley, 4, Cophall-buildings, merchant; S. C. Fox, 72, King William-street, accountant. The subscribers will elect the first directors.

THE WHITE LEAD MANUFACTURE.

THE INNOCUOUS WHITE LEAD MANUFACTURING COMPANY.

The dangers to the health and life of the workpeople inseparable from the ordinary process of white lead manufacture have given rise to many efforts to produce the material by some different and safer method—some inventors seeking to perform the present process by mechanical means, others endeavouring to procure the white lead directly from the ore. In both cases a certain amount of success has resulted, but it has invariably been found that the material is wanting in density, so that the old method has been reverted to. It appears, however, that Mr. William Thompson, of Poplar, has succeeded in overcoming the difficulties, and a company—the Innocuous White Lead Manufacturing Company—has been formed, with a capital of 100,000*l.*, in shares of 5*l.* each, to carry on his patent, which has been in successful operation for several years. It is pointed out that under the present system there are many successive laborious stages of manufacture to be gone through, and consequently the employment of many operatives is necessarily involved; but Mr. Thompson altogether abolishes such several successive stages of manual labour, thereby reducing the cost of production to a minimum. Again, when the white lead as now made is produced it is more or less discoloured, and has to be cleansed by washing, which in itself involves a certain amount of waste; and, it being impossible to cleanse all of the product, it has to be classified, and only the whitest and purest sorts realize the highest market price; but by Thompson's process the whole of the white lead produced is pure white, and no washing or classification is needed, the whole being of the same first class quality.

The gratifying manner in which the Chief Inspector of Factories referred to the process in his official reports. In that for 1876 he says that he should anticipate great advantages from the process which he had inspected. In that for 1877 he writes:—"In a recent report I drew attention to the improvement in the manufacture of white lead being effected by Mr. Thompson, whereby the injurious effects upon the persons employed might be entirely prevented, and the time required for the production of white lead greatly reduced." And in that for 1879 he says:—"A mode of manufacture has been discovered, and is in actual operation, which does not require the exposure of a single person to the direct effect of working in contact with white lead." So far, then, as the safety of the process is concerned there appears nothing to desire.

As to the commercial results, they are also described as promising. Not only will the expense of endeavouring to protect the workpeople be avoided, but it seems that under the present system there are no means for regulating the action of the acetic acid vapours and the carbonic acid gases, by which the conversion of blue lead into white lead is effected, and it sometimes happens that a whole stack is completely spoiled; but Thompson's process so regulates the conversion that such a loss is practically impossible. Hence it is claimed for the new process that the commercial advantages are:—Reduction of time in the process of manufacture from three, four, or even five, to one month at the outside. Proportionate saving of capital by the ability to turn it over so much more rapidly. Abolition of successive stages of manufacture, and consequent saving of labour. The necessity for washing, cleansing, and classification done away with, and therefore prevention of waste and saving of expense secured. Conversion of all the blue lead into one and the same high class quality of white lead, and consequent ability to command the highest price for the whole amount produced. Saving of all the expenses incurred in providing the necessary means for the counteraction and cure (so far as possible) of the injurious effects upon the workpeople. Prevention of loss from inability to regulate the conversion of the blue lead into white lead. The process is likely to prove highly remunerative to all concerned.

FOREIGN MINES.

DON PEDRO.—Mr. Treverton, Feb. 18: Accumulator: Carpenters preparing timber for box, &c. This would have been further advanced had the carpenters not hindered so much time.—Bollers: Flue from boilers to side of chimney nearly completed, and hope by the latter part of next week to complete chimney, &c.—Debris: Removed a large quantity.

Feb. 24: Accumulator: Timber work for box well in hand. Plunger stuffing-box gland put in and fixed. Table or bottom plate of box connected, and catches for same made and adjusted, so as to prevent damage to accumulator by plungers going too low.—Bollers: Flue from boilers to side of chimney completed. Flues all cleaned out, and outlets for cleaning same bricked up. Chimney will be completed in two or three days.

RICHMOND CONSOLIDATED.—Telegram from Eureka, Nevada, dated March 15: Week's run, \$50,000, from 900 tons of ore; refinery, \$50,000.

—R. Rickard, March 2: I beg to hand you report of the operations for the past week. Drift from Lizette tunnel cross-cut has been advanced 38 ft. in broken ground. The 200 north from No. 16 chamber, has been extended 15 ft. in favourable ground. The 300 north drift has been drifted 11 ft. in hard ground. The 600 north from No. 14 chute, has been advanced 27 ft.; ground more favourable for drifting. The 700 north has been extended 9 ft.; ground not quite so favourable as it has been. The 800 north-west on fissure, has been drifted 10 ft. without any change to mention. The 900 west has been advanced 3 ft. in very hard limestone. In the 1000 ft. level the quartzite has been encountered, and we are now drifting on the contact; it has been extended 9 ft. The chambers are all looking very well and turning out the usual quantity of fair grade ore. Machinery both in mine and smelting works is running smoothly.

LAST CHANCE.—Telegram received this day: Advanced 20 ft.; all ore. Commenced sinking.

EBERHARD.—F. Drake: Progress report for week ending Feb. 25: Incline Upraise (Tunnel): Distance run to Feb. 19, 400 ft.; run for the week ending Feb. 25, 28 ft.; distance run to Feb. 25, 428 ft.; run for the month of February, 38 ft. Distance run from mine incline by contract for the week ending Feb. 19, 28 ft.; distance run to Feb. 25, 28 ft.; run for the month of February, 28 ft.; total run for the week ending Feb. 19, 428 ft.; distance run to Feb. 25, 28 ft.; run for the month of February, 126 ft.—Remarks: The contract work was not measured at the end of the week. They doubtless run 5 ft., which would make the total distance 461 ft., thus leaving about 76 ft. to be driven to make the communication.

EFFUEA GOLD.—The manager (Feb. 9) writes:—Ahaante score entirely at an end. Work, which had never ceased to be partially carried on, has been energetically resumed. The ore bed, which meanwhile had been struck in four distinct places, is very rich. Exact assays had not yet been made, but will soon be forwarded. The works had hitherto been carried on exclusively on the division of the property north-east of the stream that intersects it, but on Friday, Feb. 4, in examining the south-west division of the property, he discovered a vein outcropping about 30 ft. above the level of the quartz creek. He had had samples crushed and washed from 2 ft. below the surface with satisfactory results. One ounce of gold, 15.6d. gold per ton; inside, 5*l.* 6*s.* The value of the whole of Effuea is therefore beyond all doubt, being proved both on the south-west and north-east divisions. All that now remains is to extract the gold, which is there in abundance.

COLORADO UNITED.—The latest advices from the mine are to the end of February. The main shaft is down 45 ft. below the 11 ft. level. The 11 ft. level has been driven 9 ft. 6 in. during February. The stope is without change. The timbering of the engine chamber at the head of the Union Tunnel is progressing. The concentrating mill, which has been started and worked by steam for a few days, has dressed about 60 tons of low grade ore. The engine, which has been repaired and refitted, is running extremely well.

GOLD COAST.—The manager (Feb. 8) with regard to the company's Abantukon property, says: We are making good progress with the work. Molesworth tunnel has been driven 8 ft. since my last report, still in very hard stuff. The shaft is down 26 ft., and considerable surface cutting has been done at the north tunnel. Two days ago we made a discovery which I have great confidence will prove of the highest value. About 40 fms. from our dwellings, on the same hill, I dug a saw-pit. We dug saw-pits where the timber lies. From the appearance of one side of the pit we thought we were on the footwall of a lode, and the ground is precisely similar to what we have seen on the north side of the property, forming the gold-wall there. We accordingly opened on it, and were gratified by coming on the back of a grand lode—the Saw-pit lode—some 4 or 5 ft. wide. I took some stones from the top (not 4 ft. from the surface), and found a good show of gold in all. The lie of this lode is such that we shall be able to drive a level on it from the side of the hill; and should it prove equal to what present indications point to, this find alone will make the Abantukon a most valuable property.

REBY AND DUNDERBERG.—March 21: Report of the above company's mine for the week ending Feb. 27: Dunderberg: The 750 ft. level (now being run by contract) has been advanced 38 ft. during the week. The 600 ft. level has been advanced 25 ft. during the week. The 500 ft. level has been advanced 12 ft. during the week. The 400 ft. level has been advanced 12 ft. during the week. The 300 ft. level has been advanced 12 ft. during the week. The 200 ft. level has been advanced 12 ft. during the week. The 100 ft. level has been advanced 12 ft. during the week. The 0 ft. level has been advanced 12 ft. during the week. The 100 ft. level has been advanced 12 ft. during the week. The 200 ft. level has been advanced 12 ft. during the week. The 300 ft. level has been advanced 12 ft. during the week. The 400 ft. level has been advanced 12 ft. during the week. The 500 ft. level has been advanced 12 ft. during the week. The 600 ft. level has been advanced 12 ft. during the week. 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Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. CLXXI.*

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,
Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal.)

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GENERAL THEORY OF PISTON VENTILATORS.

In the case of large screw ventilators the breadth of the ventilator would be much too great if the screw blades were formed so as to give a complete rotation; it is, therefore, usual to insert several blades, all of the same pitch. If it is considered advantageous that the projections of all the blades shall just cover the annular disc between the inner and outer circumferences of the ventilator, then the number of blades must be equal to the pitch of the blades divided by the breadth of the ventilator. Or if the number of blades is given the breadth of the ventilator will be equal to the pitch divided by the number of blades. As it is desirable that the air should enter the ventilator with the same (or less) velocity than it has in the upcast shaft, the area of the annular space between the inner and the outer circumferences of the ventilator should be made at least equal to the area of the upcast shaft. If it is decided that the inner radius of the ventilator shall bear some given proportion to the outer the above condition will determine absolutely both the inner and outer diameters of the ventilator. As any sudden change in the form of the airway or any change in the velocity leads to a loss of power, it is advisable to place a guiding cone, having its largest diameter equal to the inner diameter of the ventilator, axially, and on the inner or suction side of the ventilator. The best section for the guiding cone is that of a parabola, with the apex tapered off to a point. The airway where it surrounds the guiding cone should be gradually narrowed in diameter, so as to preserve the annular section of the airway at every place equal to the area of the upcast shaft. If the airway leading from the upcast to the ventilator is circular in section it will be of the same diameter as the upcast shaft, so far as the apex of the guiding cone, when it will gradually increase in diameter up to the ventilator, where it will be of the same diameter as the exterior circumference of the ventilator.

In order that the air shall enter the ventilator without shock—or, in other words, that the blades of the ventilator shall cut the air without beating it—the blades of the ventilator must meet the plane of the inner side of the ventilator, at such an inclination that the tangent of the inclination is equal to the velocity of the air divided by the circumferential velocity of the ventilator.

The difference in pressure between the air on the suction and the delivery sides of the ventilator, measured by the water gauge—the water gauge reading—is equal to the difference (between the square of the circumferential velocity of the ventilator and the square of the product of the axial velocity of the air, multiplied by the cotangent of the angle of inclination of the delivery ends of the blades) divided by 64 times the specific gravity of water compared with that of air. If, as is usually the case in designing ventilators, the velocity of the air in the upcast shaft (which is deduced from the amount of air) and the water gauge depression are given, the above rule still leaves two factors undetermined—namely, the circumferential velocity of the fan, and the inclination of the delivery ends of the blades. The choice of one of these two factors is left to the designer of the ventilator.

If the inclination of the delivery ends of the blades is decided upon, the number of revolutions of the fan per minute can be obtained by means of the above rule. Whilst if the speed of the fan is determined before hand the above rule will give the angle of inclination of the delivery ends of the blades, and consequently the velocity at which the ventilating current emerges into the air. The former of these two cases allows of the loss of power in the *resistance* of the air current being reduced to a minimum, whilst the latter case allows one to reap the advantage of the small speed of the ventilator.

Let us suppose, in the first case, that we reduce the loss of power owing to the velocity with which the air leaves the fan to a minimum, the velocity must then be the same as that of the air entering the fan, and the air leaves the delivery end of the blade parallel to the axis of the ventilator. Hence the inclination of the lodes remains constant, and the line of the blade is that of an ordinary screw with uniform pitch; and also the pressure of the air remains constant whilst passing through the ventilator, and the blades exercise no force on the air. This is, however, an ideal case, since the friction of the air in passing through the ventilator would retard its motion, and bring its velocity below that of the air in the upcast. This would cause the blades to beat the air, and impel it suddenly with an increased velocity, till the effect of this shock was sufficient to overcome the resistance in passing through the ventilator. Although many of the earlier screw ventilators were made with a uniform pitch of the screw, still as their effect is much below those constructed on the next supposition, most of the newer screw ventilators are constructed on the following principles.

If we suppose the pressure of the air immediately on entering the fan to remain the same as the pressure of the air in the upcast shaft (the ventilator blades are so formed as to cut the air), and that the pressure of the air on leaving the fan is the same as that of the atmosphere, then according to the above rule the circumferential velocity of the blades will be least when the delivery ends of the blades are at right angles to the front of the ventilator (parallel with the axis of the ventilator). In order that the direction of the air may be uniformly changed in passing through the ventilator, the curve of the blades should form part of a circle. The blades of the ventilator must, therefore, be described as arcs of circles, which are inclined at the suction side of the ventilator at such an angle that the tangent of this angle is equal to the axial velocity of the air divided by the circumferential velocity of the blades. At the delivery side of the ventilator these arcs must end parallel to the axis of the ventilator. With the delivery ends of the blades parallel to the axis of the ventilator, however, the absolute velocity with which the air leaves the ventilator is greatest, and consequently the loss of power owing to the high velocity of the air is also a maximum. The loss of power on this account may, however, be reduced by placing fixed delivery guide blades opposite the delivery ends of the ventilator blades. These guide blades must have such an inclination at the ends next the ventilator that the tangent to the curve of the blade at this point coincides with the direction of the air leaving the ventilator. This inclination is the same as that of the suction ends of the ventilator, but in the opposite direction. The curve of guide blades is best formed as part of an arc of a circle. The opposite ends of the guide blades should terminate parallel to the axis of the ventilator. The breadth of the annular ring enclosing the guide blades is supposed to be the same as that enclosing the blades of the ventilator.

The useful effect of the guiding blades in diminishing the velocity of the air leaving the ventilator may be still further increased by increasing the width of the annular space enclosing the guide blades on the delivery side. According to this last supposition the circumferential velocity of the ventilator is equal to the square root of the product of 32 times the water gauge depression, multiplied by the ratio of the specific gravity of water to that of air.

The breadth of the ventilator is best taken equal to half the larger radius of the ventilator, and the length of the fixed guide blades, measured parallel to the axis of the ventilator, may be taken equal to the breadth of the ventilator. The ratio between the two radii of the ventilator may be taken as 2 to 3. Von Hauer gives the following rules for the dimensions of the screw ventilators according to the above principles. The dimensions are calculated for the metrical system. The outer radius is equal to 0.76 times the square root of the quotient of the amount of air per second, divided by the axial velocity of the air entering the ventilator. The inner radius is two-thirds of the outer radius. The circumferential velocity of the

ventilator is 88.5 times the square root of the water gauge readings. The number of revolutions per minute is equal to 11.46 times the quotient of the circumferential velocity, divided by the outer radius. The tangent of the angle of inclination of the suction end of the blades is equal to the axial velocity of the air entering the ventilator, divided by the circumferential velocity of the ventilator. The angle of inclination of the delivery ends of the blades is 90°. The breadth of the ventilator is equal to half the outer radius. Taking the weight of air per second, multiplied by the height of the water gauge, as the effect of the ventilator, the ratio of the loss of effect to the effect of the ventilator is as the square of the velocity of the air entering the ventilator to 15,700 times the height of the water gauge. The velocity of the air entering the ventilator is usually a given quantity.

THE SOUTH AFRICAN DIAMOND FIELDS.

Mr. R. W. Murray, on Tuesday, read before the colonial section of the Society of Arts a paper on "The Diamond Fields of South Africa," where he said he had passed 27 years, of which 10 years were spent in the mining district in question. Mr. Harry Escombe, M.L.C., of Natal, presided. The lecturer gave a detailed account of the discovery of the first South African diamond by Mr. John O'Reilly, who found the gem in the hands of a little girl who was playing with it on the floor of a farmhouse in Albania, Griqualand West, where he was passing the night. This was in 1867, just as things were at the very worst in South Africa, whose colonists had come to regard it, owing to a long series of droughts, as God-forsaken. Stubborn local misgivings as to the stone's genuineness were in due time set at rest when it was purchased by Sir P. Wodehouse, the Governor of the colony, on the valuation of the Queen's jewellers, Messrs. Hunt and Roskell, for 500*l*. Soon afterwards the startling news flashed through the country that a diamond of over 83 carats had been found. This was the famous Star of South Africa, which fetched 11,200*l*. The lecturer proceeded to give an outline history of the prodigious mining movements which followed, the rushes to the diamondiferous districts, whether river diggings or dry, and the populous towns which sprang up on the favoured spots. In spite of great difficulties, serious complications, and conflicting claims, the new settlements flourished exceedingly. We had now in a portion of South Africa 600 miles from the colonial seaboard, and in a region which before was producing nothing, a producing power which gave them about 4,000,000*l*. per annum of raw material for the markets of the world. It had already made the fortunes of a great many people, given profitable labour to thousands of white men, and taught 640,000 natives to work for wages. We had four large towns established round the mining centres, in which trade and commerce flourished to such an extent that two years ago, when the last statistics were compiled, 1,500,000*l*. a year was paid for the carriage of goods to and from the ports. The principal town had a municipality, the revenue of which amounted to over 25,000*l*. per annum. Its effect upon the Customs dues of the Cape Colony and Natal had been that while the import returns of Natal in 1870 were 429,527*l*., they had risen to 2,176,356*l*. in 1879; the import duties of the Cape Colony had increased 5,000,000*l*. during the same period. The mining operations of the Du Toit's Pan Mine had increased so much that the London and South African Exploration Company, the proprietors of the mine, had been compelled to lay out a site for a new town. To supply the town of Kimberley and its mine with water, a water company had been started with a capital of 350,000*l*., the profits of which would far exceed those of any other water company in existence. The diamond fields found employment for three banks. A tramway was about to be laid down, and the two provinces of the Cape Colony were so dependent upon the trade of the diamond fields that they were competing with each other for the trunk railway line to connect the diamond fields with the Cape Colony. Those railways would be the means of opening up the coalfields which abound on all sides. This industry had led to the revival in England of that branch of art which had well nigh died out here—the diamond-cutting trade. It was useless to say any longer that diamonds could only be cut in Holland. In Clerkenwell, at the lapidary works of Messrs. W. Ford and Co., 18 mills were going, worked by steam, all employed in cutting diamonds, and the work done by them—all English workmen—had been proved to be superior to that done on the Continent.

THE IRON AND STEEL INSTITUTE.—The programme for the annual meeting of the institute, on May 4, 5, 6, has just been issued. The first item on the programme is the Presidential address of Mr. Josiah T. Smith, the President-elect, whose experience as one of the earliest, and for many years one of the largest, steel manufacturers in this country, and as the head of the most extensive works of their kind in the world, will give his address an exceptional interest. The papers to be read cover pretty fairly the whole field of the manufacture and application of steel for shipbuilding purposes, a subject that is receiving increased attention both from shippers and manufacturers, and which for some time past has been involved in a good deal of difficulty. The interest of naval authorities will be stimulated by the paper, announced to be read by Mr. Alex. Wilson, of Sheffield, on the manufacture of armour-plates—a subject to which that gentleman has devoted a great deal of attention, and in reference to which he has achieved, as recent Admiralty experiments have shown, a considerable amount of success. The subject of the manufacture of steel and steel plates will be dealt with by M. Sergius Kern, of Russia, who will bring before English manufacturers and users of steel improvements recently practised in Russia; while the experience lately gained in the practical use of steel for shipbuilding purposes will be dealt with in a paper by Mr. Denny, of Dumbarton, at whose works on the Clyde a considerable amount of steel shipbuilding has been turned out during the last two years. The important question of the relative corrosion of iron and steel will be discussed by Mr. Wm. Parker, of Lloyd's; and upon the results of the experiments which he has instituted will probably begin, to a considerable extent, the future of the two metals for this particular purpose. A paper is promised by Capt. Jones, manager of the Thomson Steel Works, Pittsburgh, on the manufacture of Bessemer steel and steel rails in America—a manufacture in which American practice is in some respects ahead of us; and this paper will bring out in the course of the discussion the various points wherein the experience and practice of the two chief steel producing countries mainly differ, and thus show to the trade their relative merits.

MINING INSTITUTE OF SCOTLAND.—The monthly meeting of members was held in the hall of the Institute, Hamilton, on Thursday, Mr. Ralph Moore, President, in the chair. Mr. Thomas Borland's paper, describing two modes of working thick seams of coal in the Wishaw coalfield, was discussed at great length; and on the subject of ventilation some interesting theories on the question of explosions were elicited. The President mentioned that while in London lately he met Prof. Abel, who abundantly proved that a mixture of 2 per cent. of gas in a dry mine if set fire to exploded, and carried the effects of the explosion any distance. The professor also stated that he had experimented with slate—pounded some slate very finely, and that he had experienced the same results as in the case of the coal, so that with any dry dust or material an explosion might be rendered very injurious with a very small quantity of gas. In adjourning the discussion, the President spoke in high praise of the skill and industry shown by Mr. Borland in his drawings illustrative of his paper. Mr. M. Macfarlane read a paper on the subject of "Haulage by endless ropes and chains." This being the last month of the financial year, Messrs. Bishop and Borrowman were appointed to audit the accounts of the institute.

GOLD IN NEW ZEALAND.—There appears to have been a small increase in the yield of gold in New Zealand last year, as well as in Victoria and New South Wales, judging from the colonial Customs returns of the quantity entered for duty for exportation. The total weight for last year was 305,248 ozs., against 287,464 ozs. in 1879. The increased yield was in this instance general in the mining districts, the exports from Auckland, Marlborough, Nelson, West Coast, and Otago being all greater than in 1879. The chief increase was in Otago and Auckland. Meanwhile, in the north of Tasmania mining

is also being prosecuted with renewed energy, with the result of showing that there is much untapped auriferous ground there. New finds are said to be causing an increased circulation of capital and a resuscitation of trade. The New Zealand Times argues that these results in the neighbouring colony should be considered by New Zealand as indicating what might be done in a short time with her much more extensive auriferous resources towards relieving the prevailing financial depression.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received March 5, 1881, per Tagus (s), dated Morro Velho, Feb. 2:—
GOLD EXTRACTED TO DATE.—Owing to the limited output of mineral the gold return for the second division of January has not been kept separate.

MINES.—Return of duty for 13 working days:—
Mineral raised from the mine 825 tons.
Mineral quarried per borer per diem 0.74 "
Average attendance of borers daily 85.54 "
Average attendance of natives daily 225.54

SUMP.—The accident recorded in last month's report has precluded any work being done in this section of the mine. During the stoppage the water rose to a great height, and it is estimated that it will yet take 20 days before stopping operations can be resumed.

NORTH CROSS-CUT—SECTION 276.—This driving has been extended 9 ft. 7 in. through killas of the same description as last reported. The width of the pure lode in the stopes east and west shows no alteration. The second cross-cut—Section 278—has been advanced 7 ft. 4 in.

LEVEL SOUTH-WEST UNDER ROOF—SECTION 214.
Extended 8 ft. 2 in.
No change to advise.

PERMANENT MACHINERY.—This important work has at last been finally and satisfactorily completed. On the date of the despatch of this advice the cages for the first time were successfully worked to and from the bottom of the B shaft.

TOTAL RAINFALL FOR JANUARY 12.07 in.

Advices received March 18, 1881, per Elbe (s), dated Morro Velho, Feb. 18:—

GENERAL OPERATIONS.—The limited output of mineral—1390 tons—is again due to the forced stoppages for the placing of the wire-cage conductors in the B shaft, the completion of which was seriously delayed by the breakage of the haulage change during the process of removal of the man-engine on the 2nd of January. Between that date and the 18th item the small output was confined to the A shaft. The loss of 3226*l*. may likewise be considered a nominal one, seeing that the greater part of the mineral quarried was not available for treatment.

GOLD PRODUCE FOR THE MONTH OF JANUARY.—The gold extracted during this period amounts to 6945.4 oits., equal to 830.7914 ozs. troy. It has been derived as follows:—

| | Oits. | Tons. | Oits. per ton. |
|------------------------|--------|-----------|----------------|
| General mineral | 5397.5 | from 1848 | = 2.920 |
| Arrastras, Morro Velho | 256.8 | " | = 0.138 |
| Arrastras, Praia | 221.8 | " | = 0.125 |
| Stamps, ditto | 448.0 | " | = 0.244 |
| | 6324.1 | " | 1848 = 3.427 |

Add recovered from sundries 621.3
" scrapings from retort-plates, crucibles, &c. 80.0

7025.4

The unusually low average yield per ton of mineral treated is due to the admixture of a large quantity of surface killas which was collected and stamped in order that the reduction force might not be entirely suspended.

COST AND LOSS.
Produce, 69,786.6 oits., at 7s. 9d. per oit. £2704 4 1½
Cost 5930 17 9½

Loss for the month £3226 13 7¼
MINES.—Mineral raised from the mine 1390 tons
Mineral quarried per borer per diem 0.69 "
Average attendance of borers daily 77.46 "
Average attendance of natives daily 206.11

The above return of attendance shows that a great reduction in the force was made during the aforesaid stoppage.

SUMP.—There has been no extraction of mineral from this section of the mine. The water is being steadily though slowly lowered in consequence of the recent heavy rains.

NORTH CROSS-CUT, SECTION 276. has been extended 9 ft. 7 in. This further extension has disclosed no additional indications of mineral beyond the stopes now in course of development. The ground throughout has been killas of a very unmineralised description. It would, therefore, appear that the northerly extent of this new body of mineral has been established. Width of lode within the present stopes, 21 ft.—medium pyritic mineral.

NORTH CROSS-CUT—SECTION 278: Length driven, 7 ft. 4 in., through mineral of medium grade. This greater width of the lode north of the present excavation may be taken as a strong indication that the true wall in this section has not been reached. This exploration is being rapidly advanced towards the presumed point of continuity of the lode discovered in section 276.

SOUTH-WEST LEVEL UNDER ROOF—SECTION 214.—This level has been extended 8 ft. 2 in. through unmineralised killas.

CUIABA.—Gold produce for the month of January, 1950.5 oits., from 321 tons, equal to 2.961 oits. per ton.

Expenditure on capital account—
Surface buildings and other works £452 19 5¼
Mining, milling, deep adit, &c. 734 3 9½

Total cost £1187 3 3¼
Less value of produce 381 9 10

Excess of expenditure £805 13 5¼

The produce has been derived as follows:—

| | Oits. | Tons. | Oits. per ton. |
|--------------|-------|----------|----------------|
| Fonte Grande | 252¼ | from 181 | = 1.566 |
| Pitangueira | 698¼ | " | = 4.364 |
| | 950¼ | " | 321 = 2.961 |

The latter mineral has again been of mixed quality, owing to the forced removal of a large amount of the containing rock at the point of communication with Vianna's adit. The lode eastward from that point is at present of lesser width.

The mineral extracted from Fonte Grande and Serrote sections has been of low yield, especially the latter, where the lode is generally disturbed.

SIXTH OPERATIONS in the Da Domingas shoot—see report for last July—has been resumed. The nature of the work is an inclined shaft to connect with the deep adit after its communication with the main lode.

DEEP ADIT duty for the month 61 feet.

NEW STAMPING MILL.—The greater depth of the bed-rock has retarded this important work. On the western side solid area sufficient for the erection of 20 heaps has been reached.

MORRO VELHO—GOLD EXTRACTED TO DATE.—The produce for the first division of February, a period of 12 days, amounts to 3695.9 oits., equal to 426.0769 ozs. troy. It has been derived as follows:—

| | Oits. | Tons. | Oits. per ton. |
|-----------------|---------|----------|----------------|
| General mineral | 3,323.3 | from 928 | = 3.531 |
| Re-treatment | 372.6 | " | = 0.399 |
| | 3,695.9 | " | 928 = 3.980 |

This low return of produce and yield per ton is due to the treatment of a large proportion of killas quarried in various parts of the mine during the stoppage, and to the total absence of higher grade mineral from the eastern section of the mine.

MINES.—Return of duty for 12 working days:—

| | Oits. | Tons. | Oits. per ton. |
|-------------------------------------|--------|-------|----------------|
| Mineral raised from the mine | 1315 | | |
| Mineral quarried per borer per diem | 0.80 | | |
| Average attendance of borers daily | 136.50 | | |
| Average attendance of natives daily | 280.33 | | |

No change to advise.

THE GOLD TROOP, conveying five boxes of bar gold, weighing in all 19,824 oitavas, equal to 2285.3847 ozs. troy, was despatched for Rio and England on the 6th instant.

N.B.—The gold has duly arrived.

Telegrams received:—On March 2, dated Rio, 2nd:—"Produce for short division of February (nine days), 4.00 oitavas; yield, 3.0 oitavas per ton. Large admixture of killas and quartz. Hauling 220 tons per day."

On March 10, dated Rio, 10th:—"Produce for the month of February, 12,000 oitavas; yield, 3.6 oitavas per ton. Still stamping much killas and quartz necessarily quarried in the mine. CUIABA: 280 tons stamped in the month of February; yield, 2.7 oitavas per ton. NORTH CROSS-CUT gradually becoming more permanent."

On March 16, dated Rio, 15th:—"Produce nine days (first division of March), 5500 oitavas; yield, 3.6 oitavas per ton. Mineral as by last telegram."

CASSELL'S PUBLICATIONS.—Science for All, part 41, contains papers on the Earwig, by Dr. F. B. White; on a Piece of Serpentine, by Prof. T. G. Bonney; on How Earthquakes are Caused, by Prof. F. M. Duncan; on the Origin of Our Domesticated Animals, by the Rev. M. G. Watkins; on Sea Anemones, by Dr. Andrew Wilson; and on How Buildings are Protected Against Lightning, by Dr. R. J. Mann. The History of Protestantism, part 22, extends from the Extinction of Waldenses in Calabria to the date of the Edict of Nantes. Knight's Practical Dictionary of Mechanics extends from Parchment-paper to Percussion-cap.

THE PROVIDENT.—So much interest is at present taken in the operation of the Employers' Liability Act that the periodical just issued, under the editorship of Mr. G. L. Campbell, of Wigan—the Provident—will, without doubt, be well received by both employers and employed. It contains a vast amount of information bearing upon the subject connected with all the principal industrial districts in the kingdom, and brings forward many facts which to the general reader were either unknown or forgotten, but will now be of great value, especially to workmen.

* Being Notes on a Course of Lectures on Mining, delivered by Herr Berggrath, Dr. von GROEDEN, Director of the Royal Bergakademie, Clausthal, The Harz North Germany.

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AMERICA, AND HER MINES.

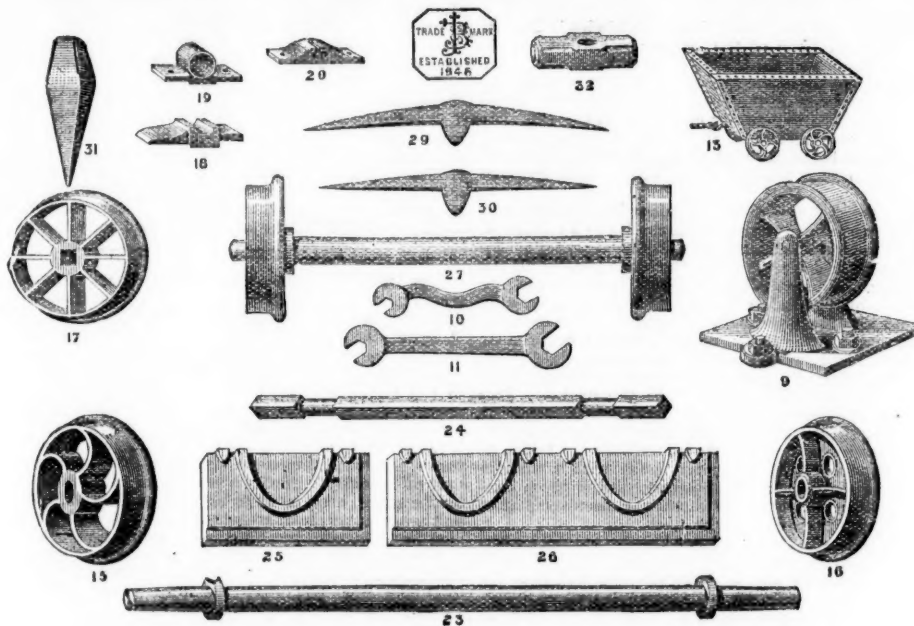
The enormous advantage which the development of its mines confer upon a country has frequently been urged, and there are probably few countries which have derived more benefit from its mineral resources than the United States, whose mines are, indeed, contributing more largely than any other branch of industry to its permanent prosperity. The recently issued Annual Report of the Comptroller of the Currency (Washington: the Government Printing Office. London: Tribner and Co., Ludgate Hill) fully recognises this fact. National banks are located in every State of the Union except Mississippi, and in every Territory except Arizona, and the total number in operation on Nov. 1 last was 2095, which is the greatest number of banks that has been in operation at any one time. The total assets of these national banks increased from \$1,510,700,000 in 1870 to \$2,105,800,000 in 1880. Their deposits increased from \$515,000,000 to \$888,000,000 in the same period, and the surplus fund and undivided profit increased from \$132,700,000 to \$166,600,000.

The movement of the currency and the operations of the banks has, says Mr. Knox (the Comptroller), never been more interesting than during the months which have intervened since the resumption of specie payments. To most of the political economists of this and other countries the resumption of coin payments by the United States at the time fixed by law, and its successful maintenance, were deemed almost impossible. Even those who were known to be earnestly in favour of resumption, both in and out of Congress, doubted the ability of the Government and of the banks to commence and continue coin payments without a preparatory reduction of the amount of notes in circulation. They say, truthfully, that no nation maintains at par a convertible paper currency which has not in its banks, or among its people, an equal amount of coin, and that, if successful, the United States would be an exception, and the only exception in this respect, among commercial nations. But the resumption Act giving authority for the purchase of coin in the markets of the world with the United States 4, 4½, or 5 per cent. bonds made resumption certain if the bonds for a sufficient amount could be readily marketed at not less than par, as authorised by law.

Purchasers for the bonds were promptly found, and resumption came so easily that many persons now believe it could have been as well accomplished one year earlier. Since the date of resumption the country has been month by month growing richer in coin, not by the sales of bonds, which have been rapidly increasing in value, but by the production of the mines and the influx of specie in return payment for the excess of exports of the abundant products over the imports. The whole country has become so habituated to the use of paper money that the difficulty has been not to provide means for its payment—for scarcely a dollar has been demanded—but to supply the people with Treasury and national bank notes, which have been almost universally preferred. The report contains a vast amount of information which will be equally interesting to political economists and to commercial men generally.

GOLD MINING FROM THE INVESTOR'S POINT OF VIEW.—A few weeks since an abstract was published in the *Mining Journal* of a paper on the Causes of Success and Failure in Modern Gold Mining, read before the Society of Arts by Mr. Alfred G. Lock, F.R.G.S., and the same gentleman has now issued a pamphlet (London: E. and F. N. Spon, Charing Cross) giving his opinion on Gold Mining from the Investor's point of view. He argues that the British investor occupies a position different from that of any other investor, because he is situated in the financial centre of the whole world, and his money is sought after by honest and dishonest men from every country on the face of the earth. He very properly points out that the title on which the property is held is the first consideration, and is of paramount importance; and explains the necessity for considering the mining laws of the district in which the property is situated, as well as the climate, water supply, timber, fuel, transport, labour, and cost of necessities, all of which will, of course, affect the results. He remarks that a rich ore is not the only desideratum; 3 ozs. of gold per ton of ore under favourable conditions, and that the intending investor must look a great deal further than at the assays of the mineral, which are a groundless basis if he wishes to place his money in a sound undertaking. It must not be expected, he says, that any mine will satisfy in the highest possible way all the conditions which he has mentioned as desirable; but no mine is worth the serious attention of a capitalist if the report made upon it does not afford a reliable statement of its position in regard to these several points, and it will remain with the intending investor to exercise his criticism and judgment, and to decide finally whether the undertaking possesses sufficient favourable or satisfactory points to make it worth the price which is asked for it, and the additional expenditure necessary to make it productive. The pamphlet contains much valuable information, and many suggestions and hints which the intending investor will be well able to turn to profitable account.

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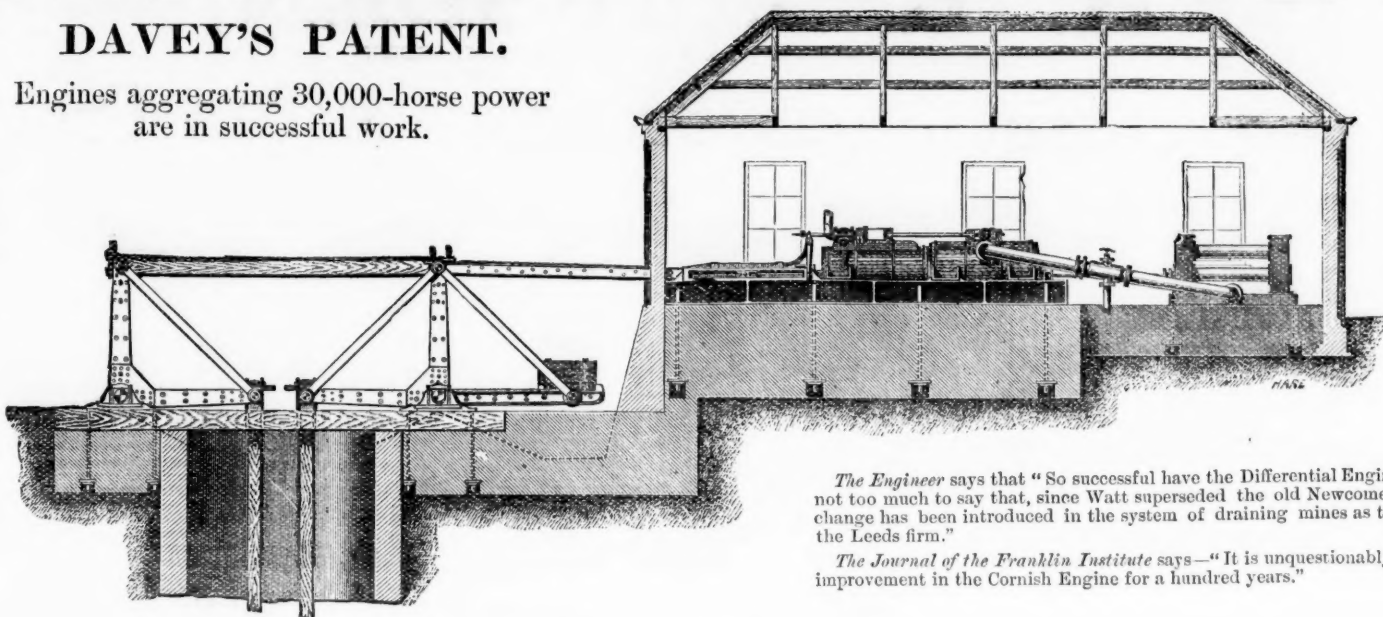
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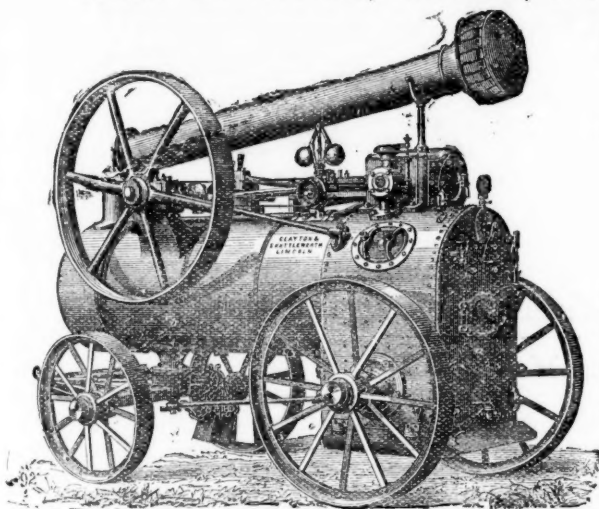
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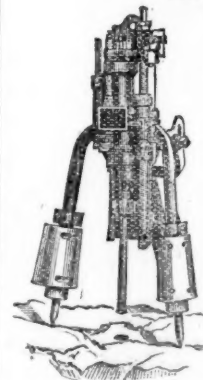
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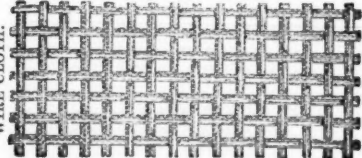
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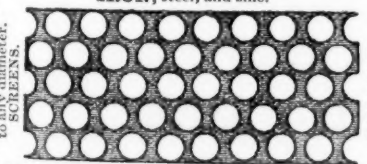
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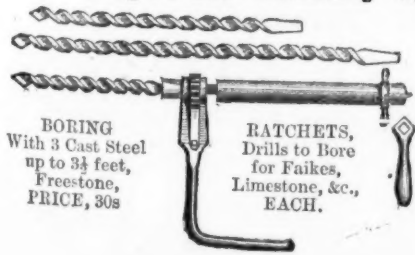
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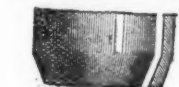
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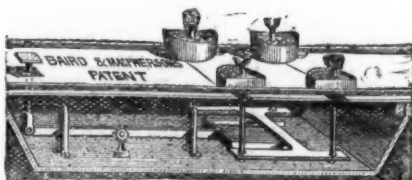


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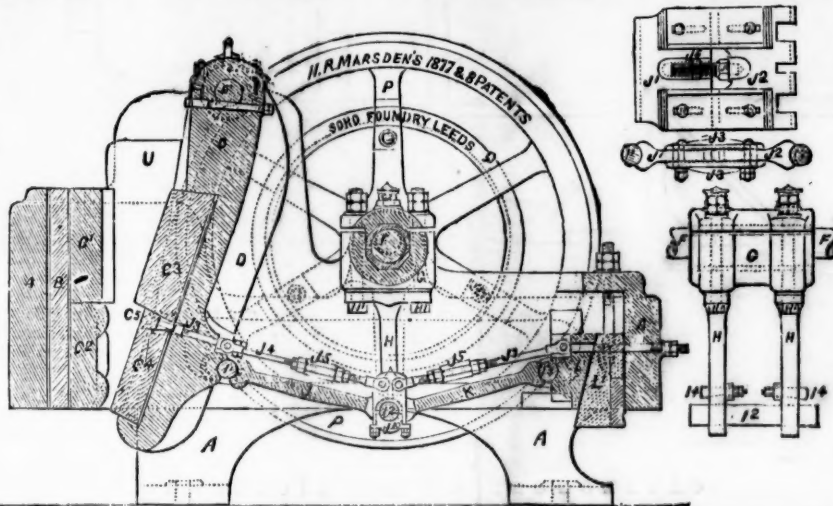
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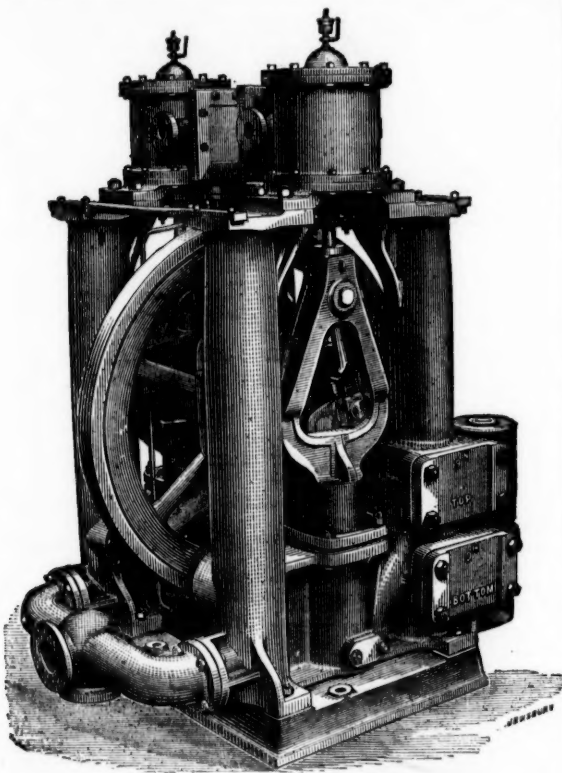
BLAKE'S STONE BREAKER.—Statement made by the Ma-
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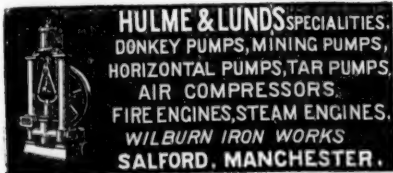
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